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A MANUAL

OF

DISCIPLINE AND INSTRUCTION

FOR THE

USE OF THE TEACHERS

OF THE

GRAMMAR SCHOOLS

UNDER THE CHARGE OF THE

BOARD OF EDUCATION OF THE CITY OF NEW YORK

PUBLISHED BY
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TEACHERS' MANUAL.

The following brief extracts from the Records of the Board of Education show the circumstances and authority under which this Manual of Instruction was prepared:

JOURNAL OF THE BOARD OF EDUCATION FOR 1882, page 693: "*Resolved*, That the Teachers' Manual be referred to the Committee on Course of Study and School Books, for such revision as may be necessary, and report thereon to this Board."

JOURNAL OF THE BOARD OF EDUCATION FOR 1882, pages 790 and 845: "*First*, That the Teachers' Manual be revised, and its provisions be made to conform to the present Course of Study. That the methods of instruction recommended in said Manual shall be suggestive only, but that in respect to other matter, when so stated therein, said Manual shall have the same force and effect as a by-law of the Board."

By the authority of the Board and the Committee on Course of Study and School Books, John Jasper, City Superintendent of Schools, and his Assistants, have prepared the Manual herewith presented.

WILLIAM WOOD,
GILBERT H. CRAWFORD,
FERDINAND TRAUD,
J. EDWARD SIMMONS,
EDWARD PATTERSON,
Committee on Course of Study and School Books.

STEPHEN A. WALKER,
President.

LAW. D. KIERNAN,
Clerk.

TEACHERS' MANUAL

FOR THE

GRAMMAR SCHOOLS

OF

NEW YORK CITY.

INTRODUCTION.

Object of this Manual.—The object of this manual is to furnish teachers with the *Course of Instruction* prescribed for the Grammar Schools, and with instructions and suggestions to aid in carrying out this course in all its requirements; also, with the by-laws, rules, and regulations which relate to the duties of teachers.

☞ The Course of Studies and the by-laws and regulations contained herein are valid requirements for the government of teachers in the discharge of their duties. As to the suggestions in relation to methods of teaching given herewith, although they embody the results of the long and wide experience of many successful teachers, and although their proper use has uniformly led to desired ends in instruction, the teacher will be at liberty to receive and to use them as the counsel of a trusted friend, and to make the modifications necessary to meet the particular condi-

tions of the pupils under instruction; but she will be held responsible for the use of such methods as will lead pupils to the attainment of proper results in their education. The true education of children is not dependent upon the use of any particular method. Methods of education are valuable only when they harmonize with the conditions under which the mind attains knowledge.

☞ Teachers are counselled to study carefully the suggestions given in relation to each subject of instruction, and to consider the principles that underlie and direct the methods, in order wisely to modify these methods when circumstances render it desirable to do so. *In education principles are like fixed laws: true methods of teaching are only ways of obeying and carrying out those laws.*

Duties of the Teacher.—No task can be more responsible or require the exercise of greater care than that of educating the young. To perform it properly, special preparation and study are indispensably necessary, not only in relation to the branches of knowledge which may have been selected as a basis for the instruction, but in regard to the proper methods and appliances to be employed, in order to render the instruction truly effective. These methods must be determined by a consideration of the faculties to be trained and educated, as well as the nature of the subject taught.

To a great extent, experience must be our guide in enabling us to judge of the character of the minds to be educated, as well as to determine the means to be employed for carrying on the work.

The teacher's task is one of great magnitude, responsibility, and labor. Great issues depend upon its right performance. The future welfare of the community depends upon her efforts. Neglect on her part—nay, conscious in-

efficiency—is a crime. The impressions which are made by her are ineffaceable. Hence it is of supreme importance that her work receive all the guidance that careful study and mature experience can afford.

The natural education of each child is begun before he enters school, by means of his personal experience with the objects and phenomena that surround him. Knowledge is the result of experience. Every teacher should aim to continue the natural processes of education by extending the personal experience of the pupils, so that the range of objects and phenomena observed by them shall be daily increased. To produce this result the teacher must select suitable materials for a proper exercise of the child's senses; then stimulate the pupil's mind to work upon them.

It is the teacher's duty to adjust the conditions between the child's mind and the objects, so that the natural exercise of the senses shall develop mental power and produce intellectual growth. The teacher's work should cause the child to notice more and more carefully his personal experiences with surrounding objects, and thereby lead to the formation of habits of observation. It is the teacher's duty to arrange the materials to which the pupils should give special attention, so as to guide their observations in a manner that will lead to a proper association of their experiences.

Knowledge consists in ideas and facts gained and properly classified by the learner. Words memorized and recited about an object, even though their arrangement be faultless, do not by themselves constitute knowledge. The child cannot be a real learner while only a passive recipient of words. Real education comes from what the child does. To effect mental development, there must be activ-

ity of the mind in connection with the object just as truly as there must be activity of the body to promote physical development. The teacher should act in accordance with these facts in the application of all methods of instruction.

In no other period of education does the importance of a proper attention to the laws of mental development rest so heavily upon the teacher as it does during the first three years of the child's school life. During this period, especially, should instruction commence with perceptions —perceptions of form, color, sounds, number, size, qualities; of right and wrong actions, obedience, etc.; and the appropriate words and language should be taught to enable the child to express the ideas obtained by means of these different perceptions.

Ideas are obtained in different ways. Some can be gained only through the sense of sight, as *color;* some only through the sense of touch, as *rough*, *smooth*, *soft*, *hard*, *hot*, *cold;* some only through the sense of smell, as *odors;* some only through the sense of taste, as *sweet*, *sour*, *bitter*, *pungent*, *astringent;* some only through the sense of hearing, as *spoken words*, *music*. Of some objects ideas may be gained through several of the senses, as the shape of an orange by the sense of sight and of touch; its color by sight; its odor by smell; and other properties by taste. The ease and accuracy with which ideas may be obtained in these different ways depend upon the degree of development which these several senses have attained. The senses are the gateways through which the mind holds intercourse with the world around it; and if these be but partly opened, or if freedom of communication be obstructed by neglecting the use of the proper means for such intercourse, the ideas obtained must be correspondingly dwarfed and imperfect.

It is a well-known fact that the proper exercise of any power, whether physical or mental, increases that power. Exercise of the several senses is therefore the true means by which the power of gaining ideas may be strengthened, and the ability to acquire knowledge increased.

It is also a well-known fact to all observing teachers that a large proportion of young children, when they first enter school, have not learned to use their senses in such a manner as to enable them to gain accurate ideas. It therefore becomes a matter of great importance that teachers of young children should give special attention to providing suitable exercises for this purpose.

GOVERNMENT AND DISCIPLINE.

INSTRUCTIONS FOR ALL THE GRADES.

True Objects of Discipline.—The training of pupils so that they shall *form right habits and learn self-control*, is the true object of discipline. In all the rules and methods of discipline employed, this purpose should be kept steadily in view. Discipline, in its relation to order, exists for the sake of the pupils and the school. It prepares the way for the work of instruction, and makes it effective. Obedience is the first condition in discipline. It includes conformity to requirements as to time, place, and manner, such as punctuality, regularity, orderly habits, and so forth.

"Like Begets Like."—"As is the teacher, so will be the school." It is, therefore, requisite that teachers should possess fixed habits of neatness, cleanliness, and order; gentleness of manner, a watchful self-control, and a cheerful spirit. In speaking let pleasant tones of voice prevail; then the words of reproof will be more impressive and effectual.

Teachers should never forget that their pupils are constantly and closely watching their conduct, and are prone to imitate whatever they observe. Scholars should, therefore, see and hear nothing that they may not safely imitate. There is an "unconscious tuition," the silent influence of which produces the most permanent effects.

Sympathy for Children.—Teachers should seek to ob-

tain the sympathetic regard of the children by giving a due attention to their wants and requests. These should be fulfilled as far as it is proper and reasonable. Children are quick to perceive and to resent injury or injustice. The child who asks for the privilege of a drink of water, for instance, may be suffering acutely; and, if not accorded relief when this seems to be perfectly practicable on the part of the teacher, may feel a sense of outrage which, for a time, if not permanently, would impair its respect and regard for the teacher. The cultivation of a due feeling of *sympathy* for the children will wholly prevent this. The possession of this feeling in its fulness is the best foundation of success in both discipline and instruction. Kindness is the practical basis of *sympathy*. It seeks the good of the pupil and endeavors to remove all imperfections of the individual without injury to him. Its influence for good is exceedingly strong, and its power with children nearly irresistible.

Encourage Pupils. — *Encouragement* inspires confidence. Children, more than others, need *encouragement*. It is a strong incentive to effort. Let it be given in all cases where this can be honestly done. To a want of this, in the discipline of classes, are to be ascribed the timidity and reserve often manifested among pupils by a hesitating manner and a low voice. A proper degree of encouragement will render them confident and spirited, eager to tell what they know, and in an audible tone of voice. Encouragement has a peculiar influence in promoting mental and moral improvement. Letting a boy know that you believe there is good in him is the best way for putting it there.

Develop Right Opinions.—Aim to govern the class by a development of public opinion among the pupils in favor

of the right and against the wrong, and thus govern individual members through the class. Give proper attention to those cases of disorder by single pupils which cannot be overcome through influence upon the class. Success in discipline does not lie in telling individual pupils their faults before the class. Attempts to detect and correct each individual misdeed in detail will not develop the right public opinion nor lead the pupils to a willing compliance with the wishes of the teacher. Judicious commendation when pupils make efforts to overcome faults is more effective toward accomplishing the desired results.

Avoid Scolding.—*Harsh tones* are unnecessary and improper. Words of disapprobation may be uttered by the teacher in a tone of *decision*, without the use of any severity that would imply resentment, anger, or antipathy on the part of the teacher. On the contrary, the language used and the tones of the voice should always express a feeling of *sympathy* with the child. This is the way to win the youthful mind, and to bend the will through the affections; a different course will antagonize it and prevent all real submission, securing only a temporary semblance of obedience. *Never threaten.* Harsh words, rough means, and appeals to corporal punishment, when employed to secure school order and certain results of study, break down the sense of honor and destroy in the pupil the proper respect for his teacher.

Attention the Basis of Good Order.—*Good order* does not require pupils to occupy, for a long time, a fixed position; nor to assume a constrained posture; nor to fix their eyes upon a given point; nor to be as motionless as statues. All this is unnatural, and much of it positively injurious, and whatever is unnatural is not good order. The postures of the pupil should be graceful, easy, and

uniform, and should be frequently changed. The movements, while as simultaneous as perfect attention would necessarily produce, should also be easy and natural.

☞ *Intelligent attention, prompt and willing obedience, with quiet, orderly movements, are the chief requisites of good order.*

Physical Education. — No system of education and school management is complete which neglects to provide for due attention to physical training. Children should be taught how to sit, to stand, to move, to walk; to abstain from the use of those things, and to avoid the doing of those acts which are injurious to health. Regulations and instructions in relation to this matter should be simple, and due attention should be given to them at every appropriate opportunity during the daily exercises of the school.

Cleanliness of person and of clothing; the importance of breathing pure air, of eating proper food, of caring properly for the eyes, the teeth, and the ears; and the necessity for daily physical exercise, should receive special attention, and be made subjects of instruction and admonition.

In the matter of proper postures, movements, etc., it is quite easy to enforce all necessary regulations, provided they are not capriciously applied. Children must first be taught them, and then *never* permitted to violate them without admonition or correction.

Due attention should be given daily to calisthenics and such other exercises as will aid the physical organs to perform their functions properly, and thereby to prepare the mind for efficient activity.

Neatness, Regularity.—Neatness, method, and regularity are among the necessary elements of popular educa-

tion. The character of children is greatly affected by their surroundings. These should, therefore, be neat and orderly. The rooms in which they assemble should be clean, the desks and other furniture, as far as possible, free from injury or defacement, everything giving evidence of constant attention. Children thus unconsciously acquire habits of order, neatness, and regularity, which have an important bearing upon their usefulness and happiness in after life.

To impart or maintain these habits, every proper means should be employed, and every requisite rule should be carefully and regularly enforced.

Moral Education.—No teacher who neglects the moral training of the pupils in the essential elements of good character does the whole duty of the instructor. The main object in moral training, as in physical and intellectual education, is to give a right direction to the action of those powers that relate to this department of our nature. Such training, to be effective, must provide suitable means for the exercise of the moral powers. It consists, largely, in leading the children to understand *their duties to themselves* and *their duties toward others*. Among their duties to themselves are: *self-control* in all matters relating to conduct—of the temper, the appetite, and the desires; speaking the truth; and self-culture in all things that aid in forming a good character. Among their duties to others are: obedience to parents and teachers; kindness to brothers, sisters, and playmates; and the practical observance of the Golden Rule. That teacher who kindly respects the rights of the pupils, and daily illustrates the great virtue—*kindness*—in the management of pupils, and in personal conduct elsewhere, will accomplish practical results in moral education which cannot

be attained by rules or lectures. A spirit of true kindness pervading a school will become a fountain of virtues.

Children do not comprehend virtue in the abstract; but they soon learn to understand it when they see it in the actions of their teachers and parents and of others around them. Let the teacher utilize the reading and other lessons, as well as school incidents, in leading the children to admire honesty, truth-speaking, unselfishness, true courage, and all right-doing, and thus sift in and mingle the moral with the mental, as Nature does in her teaching.

Lead children to discuss the character of actions described in stories, reading lessons, etc., and thus aim to develop in them the ability to discriminate justly between the right and the wrong in their own conduct.

Social relations, the dependence of each individual upon his neighbor, the necessity of labor, the benefits of society and government, should be illustrated and taught by means of easy and familiar lessons suited to the age and capacity of the children. As the development of the moral nature is of greater importance to the welfare of the individual and the community than any other part of education, no opportunity should be omitted for training children in such habits as will cause them to grow up truthful, honest, self-governing, and law-abiding citizens.

Modes of Punishment.—Every punishment should be adapted to the offence. As a general principle, if pupils abuse a privilege, punish by depriving them of that privilege for a while. If injury be done to that which belongs to another, require a satisfactory reparation. *School work should never be given as a punishment.*

Firmness, vigilance, and uniformity in dealing with children are of the first importance. The teacher should never resort to violent means, such as pushing, pulling, or

shaking the children, in order to obtain their attention. All such practices constitute a kind of corporal punishment which, in all its forms, is specially prohibited by the Board.

Modes of punishment painful to the corporeal system, such as the sustaining of wearisome burdens, unnatural and long-continued attitudes of restraint, standing, kneeling, etc., are wrongful and injurious. Equally so is the confining of delinquents by tying them or by shutting them in closets. These are all a resort to mere physical force, instead of moral incentives, and involve no appeal to a sense of honor or duty in the child. They do not properly assert the *authority* of the teacher, nor do they really produce *obedience* on the part of the pupil.

In directing the various movements required of the pupils, care should be taken never *to touch them.* The teacher should take such a position before the class as will command the eye of every pupil, and thence direct by the voice, or by a signal. Pupils must be habituated to the impression that the teacher will give the commands but *once*, and that they must be obeyed instantly.

Public exposures and badges of disgrace belong to a class of punishments which, if ever resorted to, should be employed under careful limitations, and with great circumspection and prudence; for it requires a skilful, discreet, and conscientious teacher to use them safely and with advantage. In the discipline of girls such methods should be avoided altogether, as destructive of that nice sense of shame and that delicate sensibility to reputation which should be carefully fostered in the female character. Avoid the use of ridicule; it is a dangerous remedy, and tends to the loss of self-respect in the pupil.

Summary of Important Points.—The following is a

brief summary of the practically important points in moral education, and in the training in morals and manners:

That intellectual training, however excellent, is not enough:

That public schools are instituted to make not only *intelligent* but *good citizens:*

That morals and manners are best taught *incidentally*, not formally; by personal example and anecdote, not by mere lecture:

That "unconscious tuition" by the force of the teacher's example, is a most powerful influence for good or for evil; and that this includes habits of personal cleanliness, tidiness, the avoidance of lounging in sitting or standing, etc.; punctuality, promptness, earnestness in the right, respect for the rights and feelings of pupils and others; the use of kind tones, and a kind manner; private admonition of the erring; the avoidance of all coarse and low expressions and of every form of petty tyranny.

Among the many points upon which opportunity for incidental instruction should be sought, are the following:

Respect for parents and teachers, and for the aged; kindness to the infirm; the avoidance of cruelty; abhorrence of brutality, including pugilism; courtesy and politeness; true, and false courage; bravery and foolhardiness; moral courage and decision as indispensable to a noble character; truthfulness, and the meanness of lying; the degradation involved in habits of profanity, indecency, and intemperance; the avoidance of bad books, bad papers, and bad companions; the indispensable virtue of patriotism; and, generally, to do and to be *right* because it *is* right, and not for fear of punishment, discovery, or disgrace.

COURSE OF INSTRUCTION

PRESCRIBED FOR

GRAMMAR SCHOOLS,

WITH

DIRECTIONS AND SUGGESTIONS TO TEACHERS.

EIGHTH GRADE.

Outline Course.

1. Language Lessons.—*Reading* of the grade of a Third Reader: *oral lessons* on the qualities and uses of familiar objects, such as articles of clothing, food, materials for building, and so forth: *compositions* upon subjects connected with the oral lessons of the grade: *spelling*, *meaning*, and *use* of words, chiefly from the lessons of the reading book, and from the oral lessons of the grade; also selected miscellaneous words in general use, at least 150 in number, to be taught chiefly by writing them separately, and in short sentences from dictation.

2. Arithmetic—*Written and Mental.*—Through the simple rules and Federal money, with practical examples. *Tables* of weights and measures to be taught, with simple practical applications.

3. Geography (without text-book).—The World: from globes and outline maps.

4. Penmanship.—*Words* of various length, presented in the order of their difficulty. Practice in *capitals* continued.

5. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw semicircles on vertical and horizontal diameters of four inches. Bi-symmetrical arrangements of simple and compound curves on vertical axis, two of each. Two simple historic borders, illustrating horizontal repetition of a unit. Two conventional cordate leaves; symmetrical arrangement of these leaves in the equilateral triangle and the octagon.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

READING.

General Suggestions for all Grades.

1. The number of reading lessons should bear a reasonable relation to the time the pupils have been in the grade. No selection, other than the best English poetry, should be so long dwelt upon and so frequently repeated as to render the exercise a mere recitation.

2. Should a large number of consecutive lessons in the Reader be of the same general character, a part should be omitted, so as to give variety of style and subject.

3. Where two or more classes are in different parts of the same grade, and use the same Reader, care should be taken to have a corresponding difference in their reading lessons.

4. Distinctness of articulation and the avoidance of all improper clipping of terminations, and of the omission or slurring of syllables, should receive careful and constant attention.

5. New and difficult words should be carefully pronounced and explained before the piece or paragraph is read by the pupils.

6. Where diacritical marks are used in the Reading Book the pupils should be taught to understand and apply them.

7. Lists of common words liable to be mispronounced, such as *length* and *strength*, should be made by the teacher, and the class be exercised upon them. The elementary sounds, and their more difficult combinations in words and phrases which require great mobility of the vocal organs (especially *final consonants*), should receive frequent attention. Particular attention should be given to pupils of foreign birth or parentage, so as to insure their mastery of the principal difficulties of English pronunciation.

8. Pupils should read only such selections as are within their ready comprehension, and should be accustomed to state, in their own language, the important facts, principles, and moral lessons therein taught. Words, phrases, or allusions should be briefly explained whenever necessary for the proper understanding of the piece read.

9. The voice and manner of the pupil should accord with the character and sentiment of the selection. All drawling, sing-song tones should be prevented. This is easily done when the pupils are led to understand and enter into the spirit of the piece.

10. At least once a week it is expedient to require all the pupils, except the one reading, to close their books. In this way the class will be better able to criticise, and the criticism will be more just and valuable. Besides, while the other pupils will all be kept on the alert to listen, the pupil reading will unavoidably endeavor to pronounce correctly, enunciate distinctly, and emphasize naturally. Additional effect will be given to these exercises by requiring the pupils to reproduce, in their own language, the substance of what has been read to them. The principal application of this most important exercise is in the use of supplementary Readers.

11. As silent reading constitutes nearly all the reading

that is of practical use and value to us, this method of reading should be commenced and tested in school. It is, therefore, desirable that exercises in which the class read silently should be given with proper frequency. The teacher can determine the results of the pupils' efforts by appropriate questioning and by calling upon the pupils to tell the whole or a part of the matter thus read.

ORAL LESSONS.

General Suggestions for all Grades.

1. The *leading objects* in this branch of instruction are, first, to cultivate habits of *observation and reflection*, and second, to give *facility in description*, both oral and written. Avoid everything tending to convert these lessons into recitations of set forms of words, however these forms may have been obtained, however well they may be understood by the pupils, and however important the facts thus stated.

2. In the selection of topics, "*familiar objects*," and familiar animals, plants, and minerals take precedence of all others.

It is neither possible nor desirable to attempt to teach all, or even the greater part of the topics that might be classified with the requirements of any grade. No topic should be treated exhaustively, *nor should the topics selected be so* FEW *or so* FREQUENTLY REVIEWED *as to narrow down or suspend the discipline of the observing faculty.* Too many reviews of a topic extinguish the pupil's interest in it, and are worse than a mere waste of time; they are positively injurious. The selection and limitation are left to the good sense of the teacher.

3. The *objective method* of teaching presents two dis-

tinct though intimately related departments: *perceptive teaching*, in which the object, as an acorn or an egg, is directly presented to the pupil's senses; and *conceptive teaching*, in which impressions previously received are recalled, arranged, and utilized, the objects themselves not being presented to the senses during the lesson. An oak, an elephant, or a thunder-storm, would fall under the latter department.

The use of pictures, *models*, or other sensible representations of objects, is an important combination and modification of the two principal methods, and should be often employed.

4. *Definitions* should be very sparingly introduced, and *never* in the first stages of a subject. *If given at all*, they should sum up knowledge already attained. The terms *organic*, *inorganic*, *animal*, *vegetable*, and *mineral*, are prominent among the very few terms requiring definition. Such definitions should be prepared for by a process at once inductive and objective.

5. No fact which the teacher can *readily* lead the pupil to discover or ascertain for himself should be imparted by the teacher. *Important* facts not readily derived from the pupil's own observation must of course be supplied by the teacher. Avoid overloading a topic with details, especially those of technology. As far as the character of the general subject of the grade will allow, no topic should be selected in which the number of *facts to be told* bears a large proportion to those which the pupil may be *led to find out* for himself.

6. *The language used by the pupil must be entirely his own*, excepting, of course, the few indispensable definitions. Even these definitions should form no part of any continuous oral or written statement.

NOTE.—The following exemplifies the pupil's *only* use of definitions: *Teacher*—You said coal is a mineral. What do you mean by *mineral?* You said it is a fossil substance. What do you mean by *fossil?*

7. The *process employed* will present two distinct stages: *First*, the analytical or preparatory, in which the teacher leads the pupil to discover or to remember the properties or peculiarities of an object, or to state any other important facts associated with it. The statements by the pupil will be, of course, in his own words; and the additional statements which the teacher himself may find it necessary to make, will be given in the form of familiar conversation. This stage gives the principal discipline of the powers of observation and reflection.

The points thus considered and the facts thus stated should be written upon the black-board in the briefest possible synoptical form, each one *after* it has been considered. While some such synopsis is *indispensable* to the *teacher* as the first step of *preparation* for giving the lesson, it should never be presented to the *pupil* except by the *gradual* process above indicated. (See *Note-books*, paragraph 9.)

8. The *second* or *review stage* of the process is based upon the results of the *first*, and furnishes the principal discipline of the powers of oral and written statement. The facts already considered should be rearranged, if necessary, into an orderly synopsis upon the black-board, the pupils being called upon to assist in this arrangement. This furnishes a valuable and appropriate discipline of *logical* faculty. Pupils should then be required, in turn, to state what they can recall of each item of the synopsis, then of each group of items, and, lastly, of the whole subject. Then the synopsis may be wholly or in part removed or hidden, and the oral process of review repeated. *As a*

final stage, and before dismissing the subject, an extempore *composition*, first with and then without the aid of the synopsis upon the board, should be written upon the slate by each pupil. (See *Composition*.)

9. *Note-books*.—No one can give an "oral language lesson" properly without special and careful *preparation* for teaching that lesson. To attempt to do otherwise is to fail. A synoptical outline or syllabus of the chief points or items in each lesson should therefore be carefully made ready beforehand; and, in order to economize the time and labor of the teacher, to facilitate the few necessary reviews, and to furnish a proper record of the work that has been done or attempted during the term, these synopses should be *recorded* in a *note-book*, together with such additional memoranda of authorities, illustrations, etc., as the teacher may think expedient. But it is particularly enjoined that these synopses and memoranda shall, as far as possible, consist of words and brief phrases only, merely full enough for their proper use, namely, to assist the memory of the *teacher;* to remind, not to inform.

If, on the other hand, the proposed lesson is written out in *sentences* instead of separate words and phrases, the teacher can scarcely avoid using these sentences, word for word, over and over again in the exercises, and the *note-book* becomes virtually a *text-book*, and a very crude and imperfect one. In such case, no "oral language lesson" is really given; the *oral* responses of the pupils are merely *recitations* of "set forms of words," and the final exercise in writing, instead of being a *composition by the pupil*, is only a memorized composition which has been *written and dictated by the teacher*. In this connection, see particularly the *first paragraph* of these general suggestions.

ORAL LESSONS OF THE EIGHTH GRADE.

The teacher is particularly referred to the preceding general suggestions and to the directions and suggestions given under the First Primary Grade. It is important that special care be taken that the class in the Grammar School Grade does not go over the topics taught before the promotion from the Primary. To this end the record of the promotions from the Primary should contain a list of those topics that were used in the Primary "object lessons." The teacher of the Eighth Grade should have a copy of this list in her note-book.

List of Topics suitable for Eighth Grade.—This list is only *suggestive;* no one will have time to take up even half of these topics: make selections. With the consent of the Principal the teacher may substitute any other topic or topics that may properly be included under "food, clothing, or building materials." *Avoid all minute details of technology.* Do not "review" a topic so often as to destroy the pupil's interest. Avoid frequent repetition of definitions: correct all crudities of language—*do not here dwell upon them*, but note the most important, that they may form a part of the class exercises in correction of errors in speech.

Vegetable Food—*Bread Grains.*—Wheat, rye, oats, barley, maize, buckwheat, rice. All of them seeds. Relation of some to straw. Planted every year. Trace from sowing to bread, but not too minutely. In geographical references use map of the world. Kinds of bread. Flour, grits, cracked wheat; meal, hominy, samp, green corn, corn starch (other starches); misuses of grain in preparing various intoxicating drinks.

Common Esculent Vegetables.—Select chief ones in the general order of their annual production. Tell where city children may see them growing.

Berries, Melons, and Fruits.—Domestic ones first; foreign—oranges, lemons, bananas, pineapples, figs, prunes, raisins, etc. Wine, cider, vinegar.

Sugar.—Cane, beet, maple, sorghum, molasses; other kinds and sources of sugar, in honey, milk, fruits, licorice; glucose or corn sugar.

Beverages.—Tea, coffee, chocolate.

Spices.—Black pepper, white pepper, red pepper, cloves, nutmegs, mace, allspice, cinnamon, ginger; other condiments—mustard, horse-radish, salt, vinegar, catsup, etc.

ANIMAL FOOD.—Flesh of domestic animals—beef, mutton, pork, poultry; of other animals—game, fish, oysters, etc., etc.

Butter, cheese, lard, milk.—Trades and occupations connected with food.

CLOTHING—*Vegetable Origin.*—Muslin, calico, linen, India-rubber, etc.

Animal Origin.—Woolens, silks, leather, furs, etc.

How furs and woolen clothes keep us warm. Trades and occupations connected with clothing.

BUILDING MATERIALS.—Common building stones—kinds of fine building stones—mortar, glass, paints, lumber—metals. Trades and occupations connected with building and building materials.

MISCELLANEOUS.—Matches, paper, soap, charcoal, coal, fire, feathers, glue, ivory, plaster, putty, ink.

Objects—easily procurable.—Small bunches of heads of wheat, rye, barley, ear of corn, sprigs of rice, small bottles or boxes containing various grains, hulled and unhulled rice, bran, unbolted and bolted flour; piece of sugar-cane or of corn-stalk, little boxes of sugar in three or four kinds or forms; coffee, raw and roasted; tea, green and black; cocoa-nuts, almonds, peach-pits, apples, oranges, etc., each in its season; wool, cotton, hemp, flax, silk, and pieces of their fabrics; bits of leather, and of furs of various kinds; pieces of common woods, smoothed to show the grain, etc., etc.; pictures of objects.

These and many others are frequently found in schools. The skilful teacher finds them indispensable.

REFERENCE BOOKS.—Sheldon's Object Lessons; Sheldon's Elementary Instruction; Parker's Talks on Teaching; and, especially, articles in Appleton's, Chambers', Johnson's, and other cyclopædias.

COMPOSITION.

General Suggestions for all Grades.

1. Compositions on the subjects of the oral lessons are specially prescribed for all grades excepting the first.

2. When any topic, such as sugar, nickel, the circulation of the blood, or the indestructibility of matter, has been as fully treated in the conversational lesson and review as may be thought expedient, the exercise in composition should immediately follow. This should be a class exercise on slates. Care should be taken that the pupils do not make them so long as to prevent proper correction.

3. A few pupils should be called upon in turn to read what they have written, and should be led by judicious questioning to detect any important errors in the language used, or in the statement of facts. Under proper restriction, mutual criticism by the members of the class can be made a very profitable exercise.

4. To insure a proper variety of thought and expression it is necessary that the oral lesson which forms the basis of the composition should be so selected as to give a considerable number of interesting points or items. If injuriously frequent repetition and review are avoided, the several pupils will recall different groups of items, and all undue sameness will be prevented. When identical phrases or sentences are frequently found in the exercises of the pupils, they are unquestionable evidence of bad methods both in the oral lessons and in the teaching of composition. No definitions should be found in a composition. Their only proper use is distinctly stated on page 133.

5. Some of the compositions written upon the slates

should be copied by the pupils upon paper. This should be done at least once a month in grades eight to three, and twice a month in the higher grades. As these are to be separately corrected by the teacher and returned to the pupils for rewriting, it is expected that the teacher will so adjust the length of the compositions that their correction will make no excessive demand upon his time. On the other hand, they should not be so brief as to fail to furnish the pupils with sufficient exercise.

6. The pupil should write his name and the date upon each composition. All those of the same date should be fastened together, so that the sequence of packets may show the frequency of the lessons and the general progress of the class. A list of all the subjects that have been used during the term for compositions on the slate should also be kept.

7. Written reviews of the lessons in geography and history are perhaps the very best method of permanently fixing in the memory the facts taught by those studies, and, therefore, should not be omitted: such written reviews, however, should not be classed as compositions.

SPELLING.

General Suggestions for all Grades.

1. The exercises should be both oral and written, but principally written.

2. Two lists of words that are to be studied by the pupils should be kept by the teacher of each class. The first should include only the words selected, as prescribed, from the reading and oral lessons. Care should be taken to avoid the repetition of words that have already been thor-

oughly fixed in the pupil's memory by exercises in previous grades. Words needing review on account of their difficulty should form a part of the second prescribed, or miscellaneous, list kept by the teacher. Both the miscellaneous words selected and those taken from the Reader should be suitable to the age and mental development of the pupils.

3. "Miscellaneous words" will include the ordinary proper names of persons (not the surnames), and common words of the daily life of the household, the shop, and the street.

In the selection of proper names, geographical and personal, special care should be taken to include only such as the pupils may have occasion to use in writing; as Chicago, Brooklyn, and Aaron, and not Tapajos, Pyrrhus, and Richelieu.

4. In writing short sentences from dictation, special attention should be given to words which are similar in sound but are spelled differently. Instances will present themselves, both in the selections from the reading lessons and in the miscellaneous words. Thus *piece* will require to be compared and contrasted with *peace*; *principle* with *principal*, etc.

5. The written exercises should be as neat as possible, care being taken to train pupils in habits of orderly arrangement of their work on the slate and on paper.

6. When sentences are given, particular attention should be paid to the ordinary troublesome monosyllables, the proper use of capitals, the sign of the possessive case, the period, the interrogation mark, and the use of the hyphen in a word divided at the end of a line.

MEANING AND USE OF WORDS.

General Suggestions for all Grades.

1. In selecting words for these exercises, two leading purposes should be specially kept in view: (1) To impress or illustrate the particular meaning of the word as used in the lesson; (2) to enlarge and correct the pupil's own vocabulary.

2. Where a word has, in common use, two or more meanings quite diverse, a separate illustration should be required for each; and where several words differently spelled have the same or a similar pronunciation, a separate construction should be required for each in the written exercises.

3. A pupil's vocabulary should be understood to consist of the words that he will use in speaking and writing, and of those words only. Words that are found chiefly in books, and in reference to which an appeal to the dictionary must be made, are of little or no importance so far as the pupils in our schools are concerned. Such words as "through," "chimney," and "apron," which the scholars habitually use correctly in speech, should be spelled; to require a special sentence for their use is a waste of time. "Valetudinarian," "argosy," "asphyxia," "protoplasm," and others, which the pupil may never use in construction, the teacher should carefully avoid. When such words do occur in the reading lesson or elsewhere, for the illustration of the passage the meaning should be given by the teacher, no special memorizing on the part of the pupils being required. The context and the dictionary will do what little remains to be done. To spell such words, or to use them in sentences, is worse than idle.

4. Do not attempt too much. Four or five words a day are enough, if thoroughly taught and carefully reviewed. Of these words the teachers should keep special lists, and class lists should be compared, in order that useless duplication may be avoided. The intelligent use of a word in a sentence constructed by the pupil, is the best test of his knowledge of the meaning of the word. Home exercises in the construction of sentences to illustrate the proper uses of words should never be given. No other exercise is so dependent upon the prompt criticism of the teacher.

5. In the higher grades a few common synonyms, such as *divide* and *separate*, *reflect* and *consider*, etc., if made to form a part of these exercises, will add to their variety and profit.

ARITHMETIC.

Mental Arithmetic.—1. The mental arithmetic should both precede and accompany the written arithmetic. The principal distinction between these two divisions of the subject is, that when the numbers involved are too great or too many to be readily retained in the memory, the slate should be employed as an assistant.

2. The exercises in mental arithmetic should, as far as possible, be of the most practical character. As a rule, examples given should be silently wrought by the class simultaneously, and the results obtained be written upon the slates promptly, and at a given signal. The analysis may then be required of the pupils.

3. The explanatory or analytic statements made by the pupil should be of the simplest and most direct character consistent with clearness, and all unnecessary repetition of

formulæ should be carefully avoided. Where this is not done, the principal effort of the pupil is to recall in due order the set form of words, rather than to form the arithmetical combinations necessary to the solution.

4. Besides simple examples in the four fundamental rules and federal money, very simple operations involving practical applications of the selected tables of money, weight, and measure, should constitute a portion of the exercises in mental arithmetic.

5. In the explanation or analysis of examples, in mental as well as in written arithmetic, the pupils should occasionally be called upon, before solving, to state the question.

6. Mental exercises in arithmetic should be conducted in a spirited manner. They should always have the character of extemporized exercises.

Written Arithmetic.—1. The slates should be kept in the best condition as to cleanness; the figures should be distinctly and neatly made, and be written in lines parallel to the upper edge of the slate. A reasonable allowance should be made for imperfections in the forms of figures in exercises in which rapidity is required; yet, every effort should be made to fix in the pupils habits of care, neatness, and system in all that pertains to the written exercises.

2. Exercises in adding columns of figures should be given with such frequency as may be found necessary to produce and retain accuracy and rapidity.

3. Every form of counting, whether by fingers, dots, marks, or other devices, should be strictly prohibited, and the class should be frequently tested for this special purpose.

4. The pupil should name only the results arising from the additions of the successive figures, avoiding all that

oral or mental repetition of the tables which is known as the "spelling process," and all other unnecessary formulæ.

5. The above remark, in regard to the oral or mental repetition of the tables, applies to all the fundamental rules and their applications. The processes should be reduced to the most concise form practicable.

6. When pupils show an ability to add two or more figures at a time, they should be encouraged to do so in exercises that are wrought out silently.

7. When the divisor is less than 13, the long division process is not to be employed or allowed. Examples with such divisors as 60, 1,200, etc., should be solved by short division.

8. Short practical examples, involving two or more of the rules, should frequently be given, and in such a way as to cultivate the intelligence of the pupil.

9. Examples requiring a very large number of figures for their solution should be avoided, except as far as they may be necessary in order to give practical expertness.

10. Examples should be given to test the pupils' accuracy in writing numbers requiring 0s, and their knowledge of the proper methods when the multiplier or divisor contains 0s.

11. Analogous exercises in federal money should be substituted for those in the simple rules referred to in the preceding sections, as soon as may be found expedient.

12. Exercises should be given to insure facility in reading and writing federal money, and in reducing, by *inspection*, and *without analysis*, dollars, etc., to cents or to mills, and conversely.

13. In all practical examples, instead of *telling* pupils to add, subtract, multiply, or divide, give the question in such

a manner as to oblige them to determine for themselves the method and principle to be employed.

14. No detailed analysis is necessary in addition or subtraction.

15. Give examples of bills of purchase or sale involving several items, and similar to those required in daily life.

16. Exercises in arithmetic are not to be assigned for *home study* except in the First Grade. (See § 155 of the By-Laws, 1883.)

FORMS OF ARITHMETICAL ANALYSIS.

A. (*Fundamental*)—*Multiplication.*
Question.—If 1 yard cost $3, what will 4 yards cost ?
Analysis.—If 1 yard cost $3, 4 yards will cost 4 times $3, or $12.
NOTE 1.—Avoid the too concise form "will cost 4 times 3, or 12."
NOTE 2.—*Question.*—If $1 will buy 3 yards, what will $4 buy ?
Analysis.—Similar to *A.*
B. (*Derived*)—*Division.* (1.)
Question.—If 1 yard cost $3, how many yards may be bought for $12 ?
Analysis.—If 1 yard cost $3, $12 will buy as many yards as $3 are contained times in $12, or 4 yards.
NOTE.—Avoid the too concise form "as many as 3 are contained in 12."
C. (*Derived*)—*Division.* (2.)
Question.—If 4 yards cost $12, what will 1 yard cost ?
Analysis.—If 4 yards cost $12, 1 yard will cost ¼ of $12, or $3.
NOTE.—Avoid the very faulty forms "as much as 4 is contained in $12," or "times in 12," or "4 is contained in 12."
D. (*Derived*)—*Division.* (3.)
Question.—If $4 buy 12 yards, what will $1 buy ?
Analysis.—If $4 buy 12 yards, $1 will buy ¼ of 12 yards, or 3 yards.
COMBINATIONS OF *A*, *B*, *C*, *D*.
C and A. Division and Multiplication.
Question.—If 4 yards cost $12, what will 9 yards cost ?
Analysis.—First by *C* for price of 1 yard, then by *A* for price of 9 yards.
C and B. Division. (2) *and* (1).
Question.—If 4 yards cost $12, how many yards may be bought for $27 ?

Analysis.—First by *C* for price of 1 yard, then by *B* for number of yards.

D and A. Division and Multiplication.

Question.—If $4 buy 12 yards, what will $11 buy ?

Analysis.—First by *D* for what $1 will buy, then by *A*, Note 2, for what $11 will buy.

NOTE.—*Avoid set forms of giving questions.*—Vary the order of statement as far as is consistent with perfect clearness. For instance, the "*C and B*" question might have been put thus: Spent $27 for cloth. How many yards did I buy, if $12 bought 3 yards ? or, how many yards for $27, if 4 yards cost $3 ? etc., etc.

TABLES OF MONEY, WEIGHT, ETC.

The teaching of the *Tables of Money, Weight, Measure,* etc., should be restricted to the following :

1. FEDERAL MONEY.—The usual table, its notation, and halves, quarters, and eighths of the dollar. The difference between the full table and money of accounts. Adversely to the use of the terms *shilling* and *penny.*

2. *Length.*—12 in. = 1 ft., 3 ft. = 1 yd., 5½ yds. = 1 rod, 220 yds. = 1 furlong, 8 furlongs, or 1,760 yds., or 5,280 ft. = 1 mile.

3. *Surface.*—144 sq. in. = 1 sq. ft., 9 sq. ft. = 1 sq. yd., 30¼ sq. yds. = 1 sq. rod.

4. *Solidity.*—1,728 cu. in. = 1 cu. ft., 27 cu. ft. = 1 cu. yd., 128 cu. ft. = 1 cord of wood.

5. *Dry Capacity.*—2 pts. = 1 qt., 8 qts. = 1 peck, 4 pecks, or 2,150 cu. in. = 1 bu., 36 bu. = 1 chaldron.

6. *Liquid Capacity.*—4 gills = 1 pt., 2 pts. = 1 qt., 4 qts., or 231 cu. in. = 1 gal.

NOTE.—The dry quart is about one-sixth greater than the liquid quart.

7. *Avoirdupois Weight.*—16 oz. = 1 lb., 100 lbs. = 1 cwt., 2,000 lbs., or 20 cwt. = 1 ton, 2,240 lbs. = 1 long ton, or old ton.

NOTE.—The pound avoirdupois = 7,000 grains troy; the ounce = 437½ grains.

8. *Troy Weight.*—24 grs. = 1 dwt., 20 dwt. = 1 oz., 12 oz. = 1 lb.

NOTE.—The pound troy contains 5,760 grains; the ounce, 480 grains. The pound troy is the standard unit of weight.

Time-table and Calendar.—Explain leap year. Tell time by the clock.

Miscellaneous Table.—Teach *dozen*, *gross*, *score*, *quire*, *ream*.

GENERAL NOTE.—Pupils should be carefully taught the meanings, uses, and simple practical applications of these tables.

GEOGRAPHY.

General Suggestions for all Grades.

1. It is of the first importance that geography should be so taught and reviewed, as not to leave in the mind of the pupil a mere collection of facts, without mutual relation or dependence. On the contrary, the pupil should, from the first, be taught to consider the *earth* as man's dwelling-place—its *motions* as bringing him the alternation of day and night, and the changes of the seasons—its *land-surface* as the chief theatre of animal and vegetable life—the *ocean* as the world's broad highway, and the exhaustless source of clouds and rains, so necessary to every form of life on the land-surface; its currents as modifying the climate of continents and islands—the great permanent *air-currents* as carrying to the land the moisture from the sea—the *mountains* as its condensers, as well as the chief source of mineral wealth—the *springs* and *rivers*, with their branches, as carrying back again the ever-circulating water of the ocean—and its *cities* and *towns*, not as black dots on a map, in colored patches which he has learned to call countries, perhaps near some crooked black streaks, which he has learned to call rivers, but as the centres of social life and development, the seats of government, and the crowded, busy hives of human industry and intelligence.

When geography is thus taught, it is one of the most interesting, important, and practical of studies; but, if it is taught chiefly as a description, by unvarying formulæ, of rivers, capes, peninsulas, boundaries, etc., supplemented, perhaps, by a precise, verbatim repetition of the descriptive geography, as contained in even the very best text-book, it is one of the dullest and most unprofitable.

2. Globes and maps are indispensable auxiliaries. There is no more common and pernicious error than that of *substituting the text-book for the teacher*, who thus is degraded into a mechanical *hearer of lessons*.

The pupil should be taught to have distinctly before his mind's eye the contour of the country which he may be studying, and its leading physical and political features; to this end, rough sketching of maps (from memory) will be of great assistance.

In all grades there should be exercises in latitude and longitude, and in imaginary travels by land and by sea.

The teacher of geography will find in the daily newspaper a valuable auxiliary, giving information of important events transpiring in countries under consideration.

GEOGRAPHY (EIGHTH GRADE).

In teaching the hemispheres, only such topics should be included as may readily be taught by means of a *blackboard*, a globe, and an outline map of the hemispheres. It is of the greatest importance that the pupil's first impressions be formed from the globe, rather than from the flat and distorted representation of the map.

The following are the principal points in the require-

ments of this grade. The work done should be *tested* in review, by placing the pointer in the hand of the pupil.

The *form of the earth*, its *magnitude*, the *continents* and *grand divisions*, their relative positions, their connecting isthmuses, and a few of their most important projections —the *oceans*, their positions, and principal arms and islands—five or six of the *mountain systems* of America, and a dozen in the rest of the world; three or four well-known *volcanoes*—about a dozen each of the chief *rivers* and *straits*, and about half as many great *lakes*—in a very general way, the location of the most important countries, such as the *United States*, *Great Britain*, *Germany*, *China*, *Japan*, etc., and of a dozen of the most important *cities* of the world. With each of these cities and countries some interesting or important *fact* should be at once associated.

A general notion of *climate*, as affected by distance from the equator, by elevation, and by the great ocean currents —the *motions of the earth*, and the *inclination of its axis* —the *seasons—latitude and longitude*—the *zones*, their limits, and a very few of their well-known and characteristic plants and animals—and, in a very general way, the location of the *chief races* of mankind. Only such definitions should be included as are strictly elementary.

SEVENTH GRADE.

Outline Course.

1. Language Lessons.—*Reading* of the grade of a Third Reader (a different book from that used in the Eighth Grade): *oral lessons* on animals: *compositions* as before: *spelling*, *meaning*, and *use* of words as before—at least one hundred and fifty additional words, and a review of those previously taught.

2. Arithmetic—*Written* and *mental*.—Through subtraction of common fractions, including practical applications; weights and measures—as before—completed.

3. Geography—(without text-book)—The United States.

4. Penmanship.—Single words, each to commence with a capital; short phrases.

5. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw two circles of not less than four inches in diameter. Two borders illustrating the principle of horizontal repetition—two different units to be used in each border. Two conventional hastate leaves. Symmetrical arrangement of the cordate leaves of the previous grade in trefoil and quatrefoil One example of surface covering, consisting of the repetition of a geometric unit.

STATE NORMAL SCHOOL,
Los Angeles, Cal.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for READING, found on page 20; those for SPELLING, on page 29; those for the MEANING and USE of words, on page 31; and those for COMPOSITION, on page 28, are to be taken as belonging to this grade also.

ORAL LESSONS.

ON ANIMALS.

It is particularly important that the teachers should bear in mind the chief purposes of these lessons, as already explained on pages 22–25; that they should carefully conform to the suggestions there given, and more especially those relating to "the second or review stage of the process."

Collections of objects for use in the class-room are indispensable. They need cost nothing except a little effort in procuring and care in preserving them: a properly managed class will gladly assist to supply them. An appeal to the pupils just before the summer vacation, with a few suggestions as to what things to look for and how to preserve them, will produce an abundance of material. Teeth,

shells, bones, skins, fur, eggs, large insects, pieces of coral, star-fishes; the harder parts of small animals, such as the feet, bills, wings, and feathers of birds; and a thousand other common things, are very serviceable and readily procurable. Some small and familiar pet animal, loaned to the class for a few hours, can be made to awaken an interest and to fix indelibly facts that are important. Picture charts and large wood engravings from illustrated papers are among the desirable things that are easily obtained.

In relation to the special work of the grade, the following suggestions are made:

1. Zoölogy being a science of *classification*, it is evidently necessary, even in the following simple introduction to it, to teach the most obvious distinctions upon which the classification depends.

2. Only the *simplest outline* need be taught, with such facts and details as seem most appropriate to illustrate the subject.

3. The process of classification being naturally *objective* —that is, animals being classified by their obvious peculiarities—the pupil should be led, by exercise of the observing faculties, to discover the peculiarities himself. No part of this subject is a more profitable exercise, and none furnishes so great a pleasure to the pupil.

4. Well-known typical animals should be taken as the *objective basis* of the classification; such as *man*, *monkey*, *bat*, *cat*, *rat*, *horse*, *deer*, *cow*, and *whale*;—*eagle*, *parrot*, *canary*, *hen*, *ostrich*, *snipe*, and *duck*;—*turtle*, *alligator*, *rattlesnake*, and *frog*;—*perch*, *cod*, *shark*, etc.;—*bee*, *butterfly*, *beetle*, *earthworm*, etc.;—*spider* and *crab*;—*squid*, *snail*, and *oyster*;—*star-fish*, *jelly-fish*, and *corals*.

5. The simplest names should be used, where possi-

ble, in preference to the more scientific, or, at least, as preparatory thereto; thus, it is better to use the term *four-handed* than *quadrumana; gnawers* than *rodentia; scratchers* than *rasores; two-winged* than *diptera;* etc. A few scientific terms, such as *mollusk* and *bivalve*, are in such common use that they may be readily and profitably explained and applied.

6. *Associated facts not strictly scientific*—such as the uses of animals, anecdotes concerning them, peculiarities and habits which the pupils have themselves observed or have learned by reading or otherwise—should form an important part of these exercises.

7. The pupils should be encouraged to acquire as many facts as possible, by their own observation and reflection. For this purpose the collection of animals in the Central Park, and others that are occasionally exhibited in the city, may be employed.

8. The exercises should be *conversational*, the reviews only frequent enough to assure the teacher that the class, as a whole, has understood the instruction given; the instruction should also embrace exercises in classifying well-known animals from a miscellaneous list, giving the reasons in each case. Too much, however, should not be attempted.

9. Some system of *diagrams*, roughly sketched in chalk, will be found of great service in assisting the pupils to remember the classification. The best and simplest is, probably, that used in the ordinary "genealogical tree." The diagram should be gradually developed, item by item, as the lesson proceeds—the whole of it should not be given in the preliminary stages.

10. The indispensable classified "outline" can be readily prepared from any of the school manuals on the rudiments

of natural history. Some of them are mentioned below. See also "General Suggestions," pages 22–25.

11. It is not expected that the classification should extend to *species* and *varieties*, sometimes not even to *genera*. It is desirable that pupils should have some definite ideas as to the relations of the following terms used in zoölogy: *kingdom*, *branch* or *type*, *class*, *order*, *family*, *genus*, *species*, *variety*, *individual*. These can be best exhibited by a diagram, but should in no case be presented by formal definition. All but the last four should be mentioned in describing any given animal.

12. The exercises should include portions of the topics suggested in the following synopsis, which is here presented for the guidance of the teacher. *No teacher or class can find time to take up* ALL *the topics presented in this synopsis. It is to be expressly understood that the teacher will use only such part or parts of these outlines* (*or of their equivalents from other sources*) *as the Principal of the department may direct.* This synopsis comprehends three successive outlines, each complete in itself or with that preceding it.

First General Outline.

Distinction between organic and inorganic objects taught objectively. The principal differences between animals and plants. What is an *organ?* An animal? Four great *types* of animals (Cuvier's, omitting the *protozoa*). Exercises in classifying, by *types* only, such animals as the *dog*, *lobster*, *clam*, *coral*, *shad*, *wasp*, *goose*, *star-fish*, *garter snake*, *shrimp*, *toad*, *tortoise*, *oyster*, etc.: the reasons of the classification should be given by the pupil in each case. Each type to be then briefly defined. Why vertebrates are placed first, articulates next, etc.

Include, also, such of the following questions as may be appropriate: Where does it live? How breathe? Color of blood? Blood warm or cold? What covered with? How many limbs, and for what use? Upon what does it feed? Term *vertebrate* and *invertebrate*.

Second General Outline.

Classes of Vertebrates.—(Tenney's arrangement is brief and simple.) Illustrate as in cases of the types, by mentioning animals belonging to the several classes, mammals (those which feed their young with milk), birds, reptiles, batrachians (frog kind), fishes; brief description of each class to be given. Why mammals *first* and fishes *last?* Use *questions* of first outline. Name common vertebrates to be classified, occasionally mentioning an animal not a vertebrate, in order to test the attention and accuracy of the pupils; for example, *alligator*, *robin*, *mouse*, *worm*, *herring*, *toad*, *lion*, *jelly-fish*, *rattlesnake*, *elephant*, *flea*, *hawk*, *turtle*, etc. The pupil should give the reason for the classification.

Classes of articulates to be treated very briefly, but in the same manner as the vertebrates. Simplest division (as *insects*, *crustacea*, and *worms*) to be employed.

Classes of mollusks—treat also briefly, by referring to their general characteristics only. Teach the meaning of the terms *univalve* and *bivalve*. Specimens of shells will be useful for illustration; but it must be remembered that the structure of the animal itself is far more interesting and important than that of the shell which incloses it.

Classes of radiates, probably treated with sufficient fulness in connection with types. Review, if necessary.

Here it would be well to teach very briefly the classification of animals as *herbivorous*, *carnivorous*, and *omnivorous;* also, the general relations of the *teeth* of animals to their other peculiarities, such as their *feet*, *forms*, *food*, *digestive apparatus*, and *habits;* for instance, the relation of the talons of the eagle to its beak. Also, as far as may be readily done, show that animals are useful in various ways; the carnivora, for instance, in preventing over-crowding; and, if some animals are referred to as *quadrupeds*, do not omit to mention also that others are bipeds, hexapods, octopods, decapods, centipedes, myriapods, and apods. Better say two-footed, four-footed, etc. Name an animal with two feet; four feet; six; eight; ten; twelve; with many feet; no feet.

Third General Outline.

In this outline many *orders* should be omitted by the teacher, or merely referred to, because not readily treated objectively. The following embraces all that *may* be taught. Of course, the whole cannot be taught to any one class. Make such selections as may seem expedient.

Mammals.

Order 1.—*Two-handed* (*Bimana*).—To be treated briefly. The five races of men, with their characteristic peculiarities. The geographical distribution of these races to be also briefly referred to. Use outline map in geographical references.

Order 2.—*Four-handed* (*Quadrumana*).—A few examples only, according to the experience of the pupils. Refer to the geographical distribution.

Order 3.—*Hand-winged* (*Cheiroptera*).—Use a drawing or a dried specimen, if one can be procured. Any interesting facts about bats, and their nocturnal habits.

Order 4.—*Insect-eaters* (*Insectivora*).—Omit altogether, except to *name the mole* as such, and refer to its small, hidden eyes, etc.

Order 5.—*Flesh-eaters* (*Carnivora*).—To be treated somewhat more fully. Refer to general structure of teeth, feet, and digestive organs. Refer to *cat family*, using common cat as type; *dog family*, using dog as type; *weasel family*, their form, habits, etc., naming *sable*, *marten*, *ermine*, and *mink*, and referring to the value of their furs; *bear family;* also, briefly to *seal family;* name the most common carnivora found in the United States.

Order 6.—(*Marsupials*).—Refer to the geographical distribution. The exception of the opossum, very briefly.

Order 7.—*Gnawers* (*Rodents*).—Use the *rat* or *squirrel* as a type. Refer to peculiarity of teeth, and the provision for their continued growth. Teach about the *rat*, *mouse*, *squirrel*, *beaver*, *rabbit*. Refer to the *woodchuck*, *porcupine*, and *guinea-pig*.

Order 8.—*Thick-skinned* (*Pachyderms*).—Treat briefly of the *elephant*, the *rhinoceros*, and *swine* families; more fully of the *horse family*, including *horse*, *ass*, and *zebra*. Geographical origin of the horse, its dispersion, and its influence in human affairs.

Order 9.—*Cud-chewers* (*Ruminants*).—Relations of food to teeth, stomach, feet, etc. Teach three families: 1, *deer family*, horns solid, deciduous; 2, *hollow-horned family* (horns permanent); 3, *camel family* (hornless). Refer to *llama* and *vicuna*.

Order 10.—*Whale-like* (Cetacea).—Refer to fish-like character of whale; how dissimilar; its uses. The *porpoise* and *dolphin*.

Birds.

1. Birds of Prey (*Raptores*).—Vulture, falcon, owl, condor, hawk, eagle. Soaring birds.

2. Climbers (*Scansores*).—Parrot, woodpecker, etc. Tree birds.

3. Perchers (*Insessores*).—Give a few well-known birds as examples. Tree birds.

4. Scratchers (*Rasores*).—Gallinaceous birds and dove family. Ground birds.

5. Runners (*Cursores*).—Ostrich; its habits. Ground bird.

6. Waders (*Grallatores*).—Crane, stork, snipe, etc. Shore birds.

7. Swimmers (*Natatores*).—Duck family, swan, petrel, penguin, albatross, etc. Water birds. Refer to *nests* of birds; to their *migrations*, *instinct*, etc.

Review in connection appropriate parts of first and second outlines.

Reptiles and Frog-kind.

Treat very briefly, teaching something of turtles, crocodiles, alligators, and lizards; snakes and their fangs; the frog and its transformations; why called amphibious.

Fishes.

Treat classification very briefly. Show the two groups; *first*, the group of *bony* fishes, including the order *Spinefinned;* perch, porgy, blackfish, bluefish, weakfish, etc.; and the order *Softfinned;* herring, shad, trout, salmon, whitefish, smelt, goldfish, cod, flounders, halibut, eel; and *second*, the group of cartilaginous fishes, including the sturgeon, the shark, the ray, etc. Interesting facts in regard to fisheries.

Articulates.

These present many advantages for the school-room. They are small and easily procured for perceptive teaching. A simple microscope is a great assistant in awakening an interest. Of *insects*, collections of type specimens can easily be made. *Only the simplest and most interesting facts, however, need be taught.* The general characteristics of this class of animals should be explained—their structure and the functions of their chief organs. Their wonderful *transformations* should be explained and exemplified; difference between *insects proper*, *spiders*, and *many-footed articulates* (*myriapods*). The important influence of many insects upon mankind; destructive insects.

The following orders may be taught and exemplified:

1. *Membrane-winged* (*Hymenoptera*).—Including the *bee family*, the *ant family*, the *wasp family;* the *ichneumon family*. Their peculiarities, habits, and *instinct*.

2. *Scale-winged* (*Lepidoptera*).—Moths and butterflies, caterpillars, etc., clothes moth, geometer.

3. *Two-winged* (*Diptera*).—Mosquito family, wheat-fly, house-fly, etc.

4. *Case-winged* (*Coleoptera*).—Beetle, fire-fly, weevil, etc.

5. *Half-winged* (*Hemiptera*), or bugs; cicadas or harvest-flies, tree-hopper, cochineal, boat-fly, etc.

6. *Straight-winged* (*Orthoptera*).—Cricket, katydid, locust, grasshopper.

7. *Net-winged* (*Neuroptera*).—Dragon-fly, May-fly. Refer to the white ants.

Spiders (*Arachnida*).

Many-footed insects (*Myriapoda*).—Centipedes.

Crustacea.—Crab, lobster, shrimp.

Worms.—Earthworm. (See Darwin's Vegetable Mould for interesting and useful information.)

NOTE.—It is important to distinguish carefully the three terms, *insect* (*i.e.*, six-footed [hexapod], or true insects), *arachnids*, or eight-footed spiders and scorpions, and *myriapods*, or many-footed millipedes and centipedes. In using a representative of one of these groups it should be the primary aim to establish firmly in the pupils' minds the obvious characteristics by which it is distinguished. Thus, in the insect proper, the body is divided into three divisions—the head, the body (or thorax), and the hind-body (or abdomen). The head is furnished with feelers (*antennæ*); the body supports three pairs of legs, and generally one or two pairs of wings; the abdomen shows more or less clearly a number (seven) of rings or joints. In the arachnids, the head and body are consolidated into one division, which has no antennæ, supports four pairs of legs, but no wings. In the myriapods, the entire body consists of a series of very similar joints—not grouped into divisions separated (insected) from one another—of which the first serves as a head, whilst each of the others, however numerous, supports either one or two pairs of more or less imperfect legs.

Reference Books.—Among the many books in which the teacher may find an unlimited supply of interesting material suitable to this grade, only a few of the most easily procurable can here be mentioned. Any of the ordinary text-books on zoology; Hooker's Child's Book of Nature; Wood's Homes Without Hands; Wood's Natural History; Wood's Man and Beast; Stevenson's Boys and Girls in Biology; T. R. Jones' Animal Creation; Kirby and Spence's Entomology; Lubbock's Ants, Bees, and Wasps; A. B. Buckley's Progress of Science, Fairy Land of Science, Life and Her Children, and Winners in Life's Race; numerous articles in Appleton's, Johnson's, and Chambers' Cyclopædias.

ARITHMETIC.

Written and Mental.—For suggestions see pages 32–35 and the following:

1. *A review of Federal Money* should form a part of every grade up to the *fifth*, inclusive, after which it blends with nearly all the other arithmetical exercises. It should form a part of the *regular* class-work each week, and at the monthly reviews.

2. "Practical applications" will include such questions as may be readily given in connection with the commonly used tables of money, weight, measure, etc.; as, "In $\frac{5}{8}$ lb. of sugar, how many oz.?" "Eighteen quarts are what part of a bushel?" etc.

3. In the written exercises pupils should use the signs of operation, +, −, ×, ÷, and the sign of equality, to indicate the work performed and the result.

4. At the outset the subject of fractions should, as far as possible, be made to coincide with the acquired experience and simple notions of a child.

SYLLABUS OF TOPICS FOR ARITHMETIC.

(With Suggestions and Examples.)

I.—The *idea* of a fraction developed *objectively.*
The *equality* of the parts to be very carefully illustrated.
The *relative value* of various fractional parts, *as greater or less.*
The *definition* of a fraction.
The *terms* of a fraction *defined*, and the order of *statement.*
The *notation* of fractions and *location* of terms, or *order* of *writing.*
Exercises in writing and explaining fractions.
What part one integer is of another; as, 3 is what part of 7?
Show objectively that $\frac{2}{4} = \frac{1}{4}$ of 3.
Fractional expressions *less* than a unit—proper fractions.
Proper fractions defined, and examples.

Fractional expressions *equal to* or *greater than* a unit—improper fractions.

Improper fractions defined and illustrated.

Exercises in writing proper and improper fractions.

NOTE.—The consideration of compound and complex fractions is reserved for the Sixth Grade.

II.—FUNDAMENTAL AXIOM, $1 = \frac{n}{n}$; or, $\frac{n}{n} = 1$.

Reduction of units to improper fractions.—*Analysis A.* (Page 52.)

Definition of mixed numbers.

Reduction of mixed numbers to improper fractions.—*Analysis A.* (Page 52.)

Reduction of improper fractions to whole or mixed numbers.—Analysis B. (Page 52.)

III.—Reduction of fractions to higher terms. [What may halves, thirds, etc., be changed into ? $\frac{4}{5}$? etc.] To be illustrated objectively.

Examples to be solved by inspection; also, those that cannot be solved by inspection.—*Analysis C.* (Page 52.)

Term *Divisor* or *Factor*, with exercises in finding, by *inspection*, a *Common Divisor* or *Common Factor.* Definition to be given.

NOTE.—Too great importance can hardly be given to this exercise of inspection. The application of the principle is indispensable in many of the arithmetical exercises in every succeeding grade. With proper training, it will become, within reasonable limits, a fixed mental habit requiring no conscious effort.

Greatest Common Divisor. Definition. Examples to be solved by inspection; also by special method.

Reduction of Fractions to Lower Terms. Exercises, etc.—see above.

Definition of "Lowest Terms."—Examples in finding what part one whole number is of another: corresponding examples in tables of weights and measures.

Examples to be solved by inspection; as $\frac{1200}{1800}$, $\frac{250}{750}$, etc.

Examples involving the special method of finding the greatest common divisor; as $\frac{221}{323}$, $\frac{169}{533}$, etc. Examples not to be too long.

IV.—Multiple—term illustrated and defined. *Multiple* identical with *product.*

Common Multiple—term illustrated and defined; also least common multiple.

Exercises, to be solved by inspection, and otherwise.

Reduction to Common Denominator—use two fractions at first.

Application of common multiple to reducing to common denominator.

Distinction between common multiple and common denominator.

Definition of common denominator.

Definition of least common denominator.

Examples in reducing to least common denominator.—*Analysis C.* (Page 52.)

Examples involving preliminary reduction to lowest terms.

V.—Impossibility of adding quantities with unlike names, illustrated; add 3 dogs and 4 cats; 3 animals + 4 animals = 7 animals.

Adding things of like names.

Adding fractions of the same denominator—Examples.

Use of common denominator as the indispensable basis for the working and explanation of Addition and Subtraction of Fractions.

Addition of Fractions of different denominators—Examples—*Analysis C.* (Page 52.)

Importance of reducing to least common denominator.

NOTE.—Say "*Reduce to least common denominator*," rather than "*Find the least common multiple of the denominators.*" Of course, the latter forms *a part of the process* of the former.

Only the numerators added. Why?

NOTE.—At the outset give not more than two fractions, but advance beyond this limit as soon as practicable. Give examples involving reduction to lowest terms.

Addition of mixed numbers. Examples.—*Analysis C.* (Page 52.)

NOTE.—See that the sign of operation and the sign of equality are not omitted. Avoid reducing mixed numbers to improper fractions.

Subtraction of Fractions of different denominators. Examples.—*Analysis C.* (Page 52.)

Subtraction of Mixed Numbers. Examples.—*Analysis C.* (Page 52.)

NOTE 1.—All suggestions with reference to addition of fractions apply with equal force to subtraction of fractions. Say "*Find the difference of their numerators;*" avoid saying "Subtract their numerators."

NOTE 2.—Questions should occasionally be varied by asking "Which is the greater?" or "What is the difference?" etc.

NOTE 3.—Give *practical* examples involving both addition and subtraction.

GENERAL NOTE.—Teachers should remember that arithmetic is not only a *science*, but also a practical *art;* that this art involves important *devices*, many of which have already been taught, and the principles of which have been explained. These devices, such as reducing to lowest terms, rejecting terminal 0s of a divisor, etc., should not at any time be lost sight of. Examples of such character as to require these devices should be given occasionally in the special subjects of each grade. The

omission or neglect of these important matters will be a serious defect in the character of the instruction given.

FORMS OF ANALYSIS FOR THE SEVENTH GRADE.

Analysis A.—Example—Reduce $5\frac{1}{2}$ to halves, or to an improper fraction: $1 = \frac{2}{2}$; $5 = 5$ times $\frac{2}{2} = \frac{10}{2}$; $\frac{10}{2} + \frac{1}{2} = \frac{11}{2}$.

Analysis B.—Examples.—Reduce $\frac{15}{2}$ to units, or to a whole or mixed number: $\frac{2}{2} = 1$; $\frac{15}{2} = \frac{15}{2} \div \frac{2}{2} = 7\frac{1}{2}$. This may be expressed, also, as follows: Since $\frac{2}{2} = 1$ unit, $\frac{15}{2}$ will equal as many units as $\frac{2}{2}$ are contained times in $\frac{15}{2}$; or will equal $7\frac{1}{2}$.

Analysis C.—Example.—Reduce $\frac{2}{3}$ to ninths: $1 = \frac{9}{9}$; $\frac{1}{3} = \frac{3}{9}$; $\frac{2}{3} = 2 \times \frac{3}{9} = \frac{6}{9}$.

NOTE 1.—In teaching this analysis, attention should be carefully called to the fact that, if *both* terms of a fraction be multiplied by the same number, the *value* of the fraction will remain unchanged. Example: Reduce $\frac{3}{7}$ to twenty-eighths: multiplying denominator and numerator by 4 we have $\frac{3}{7} = \frac{12}{28}$.

NOTE 2.—By *Analysis C* it is shown that $\frac{2}{3} = \frac{6}{9}$. From this it is evident that, conversely, $\frac{6}{9} = \frac{2}{3}$; or, if *both terms* be divided by the same factor, the value of the fraction will not be changed. Or, again, if the question be asked, "6 is what part of 9?" the immediate answer will be $\frac{6}{9}$. If the same question be modified into "two 3's are what part of three 3's," the answer becomes $\frac{2}{3}$. Hence, it will be sufficient to say that a fraction is reduced to its lowest terms by dividing both terms by their greatest common divisor, because this does not change its value.

TABLES OF MONEY, WEIGHT, ETC.

1. Review thoroughly the tables of the Eighth Grade.

2. Add the following to *Long Measure:* 4 in. = 1 hand, 3 feet = 1 pace, 6 feet = 1 fathom, $1\frac{1}{6}$ miles = 1 knot.

3. *Surveyors' Long Measure.*—66 feet, or 4 rods, or 100 links = 1 chain, 80 chains = 1 mile.

4. *Surveyors' Square Measure.*—16 sq. rods = 1 sq. chain, 10 sq. chains = 1 acre, 640 acres = 1 sq. mile or *section*, 36 sq. miles = 1 township.

Explain the use of *section* and *township* in measuring land surveyed by the United States.

5. *Miscellaneous Avoirdupois Weight.*—60 lbs. = 1 bush. wheat, 196 lbs. = 1 bbl. flour, 200 lbs. = 1 bbl. beef or pork, 100 lbs. = 1 quintal of fish, $62\frac{1}{2}$ lbs. or 1,000 oz. = 1 cu. foot of water.

6. *Apothecaries' Weight.*—Teach the table and its use. Show that its lb., oz., and grain are identical with those of troy weight; that the only difference consists in the subdivision of the ounce. Teach the *fluid* ounce and its divisions.

7. *English Money, etc.*—The usual table; the value of a *pound sterling*—$4.87; of the *franc*—19 cents 3 mills; of the German *mark*—23 cents 8 mills.

If any foreign dollar is taught, let it be the *dollar* of North Germany —71 cents 4 mills.

8. *Angular Measure.*—Teach the following terms: *Circle, circumference, quadrant, radius, diameter.* Teach the notation. Give examples in reading: as, 16° 17′ 45″.

60″ = 1′, 60′ = 1°, 90° = 1 quadrant, 360° = 1 circle, 69½ miles = 1 degree of latitude. Circumference of a circle = 3⅐ times the diameter (very nearly).

General Note.—Pupils should be carefully taught the meanings, uses, and simple practical applications of the above.

GEOGRAPHY.

United States.—A simple outline will embrace the following:

1. *Local Geography.*—The boundaries of the country as a whole, its dimensions and population in round numbers, the location of the great mountain systems, the western plateaux (a "*section*" of the country roughly drawn in chalk upon the blackboard will be found efficient), the high western plain, the low central plain, the eastern slope, and the California basin; about a dozen of the chief rivers, including their great branches; about five or six each of the great lakes, bays, and capes; about twenty-five of the principal cities, and the names of the several States and Territories, individually and in groups.

The capitals and a few other important details of the States should also be taught.

All local geography to be taught with the assistance of the outline map and the pointer, and to be reviewed with

and without the map. Pupils should be required to sketch rapidly on slate or blackboard outlines of maps.

2. *Descriptive Geography* will include a very brief description of the highlands, lowlands, and drainage system already pointed out; a general idea of the climate and its gradual modifications by latitude, elevation, and distance from the sea; and a general statement of the leading agricultural staples in the order of their latitude—rice, sugar, cotton, tobacco, corn, and wheat; also the chief minerals, and the principal animals, wild as well as domestic.

Special care is to be taken that this outline shall be such that it can readily be completed and thoroughly reviewed before the promotion of the class to the next higher grade. The descriptive geography, though very brief, is of the highest importance. It is necessarily based upon the map exercises. These are indispensable, but must not be permitted practically to exclude the descriptive.

SIXTH GRADE.

Outline Course.

1. Language Lessons.—*Reading* of the grade of an easy Fourth Reader: *oral lessons* on plants: *compositions* as before: *spelling*, *meaning*, and *use* of words, as before—at least 150 additional words, and review of all previously taught: easy exercises in *suffixes*.

2. Arithmetic.—*Written* and *mental*.—Common fractions completed.

3. Geography—(without text-book).—General Outlines of South America and Europe.

4. Penmanship.—Single words continued; also short phrases and easy sentences.

5. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw two ellipses, one on vertical major axis of 4 inches, one on horizontal major axis of 4 inches. Draw two ovals of different proportions. Compound curves on vertical axis. Two examples of vases of different styles. Draw one conventional leaf and one flower, two views of each; the same in an original design. Draw a vertical border, using the hastate leaves of the Seventh Grade.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for
Reading, found on page 20; those for
Spelling, on page 29; those for
Meaning and Use of Words, on page 31; and those for
Composition, on page 28, are to be taken as belonging to this grade also.

ORAL LESSONS.

On Plants.

1. The general suggestions given in connection with the subject of animals in the preceding grade, in relation to the extent of classification, the terms employed, the collection of objects, etc., are equally applicable to the subject of plants. As a field for cultivating the observing faculties, the study of plants has a decided advantage over the study of animals, especially for educational purposes, inasmuch as the objects of which it treats may be exhibited more conveniently in the class-room, and may be examined, dissected, and analyzed with greater facility.

2. The *classification* of plants into orders and families being based upon distinctions often very minute, must, for the purposes to be accomplished in these simple lessons, be carefully limited. Only a few common plants need be

classified. Suggestions as to the nature and limitations of the classification are indicated below.

3. The first lessons should train pupils to notice how plants grow from the seed; should show the *structure* of plants and the general functions of each of their *organs of vegetation*—the *root*, the *stem*, and the *leaf*. Make selections from the following:

A few large beans and other seeds may be conveniently examined in the class-room. Soak them and show the *germ* or embryo, the *seed* leaves, the coat. Show that the coat protects the germ, as the shell does the egg; that the seed leaves contain and supply the first food for the infant plant, before it can obtain food for itself from the ground and from the air. Plant a few such seeds in boxes a few weeks or days before wanted for study. Show the development of the ROOT and the STEM, the latter always toward the light. Warmth and moisture needed first, then light, soil, and air.

Roots, kinds of; fibrous, branching, etc., parts of the root—the little sponges; uses of the root to the plant; air roots of certain vines.

Stems, varieties of; solid and hollow, simple and branching; varieties of size, from trees to the smallest; some increase from inside, therefore called *inside growers* (endogens), (corn, sugar-cane, palm tree, grasses, etc.), and have no bark. Some have a bark and increase by layers of wood just under the bark; therefore called *outside growers* (exogens), (oak, apple, flax, sunflower, etc.). Illustrate both kinds by specimens.

Sap.—Vegetable blood—flows up and down through the bark, and the young wood under it. Uses of the bark in circulation, respiration, growth, and protection.

Leaves.—Parts; blade, foot-stalk, stipules: *kinds of;* mostly flat blades and needle-shaped; examples. Simple leaves; compound leaves; examples. *Forms* of flat leaves (*very briefly*) from objects; use simple terms, round, heart-shaped, etc., instead of orbicular, cordate, hastate, etc. *Margins* (*very briefly*), entire, toothed, wavy, jagged. *Veining;* ribs, veins, veinlets; net-veined, parallel-veined. Green *pulp* of leaf—all inclosed in transparent *skin*. *Seed-leaves*—of embryo—division of plants into those having one seed-leaf, two seed-leaves, many seed-leaves; examples of each.

Show the *important connection* of the character of the *veining* and the *number* of the seed-leaves, with the method of growth of stem, as *inside*

growers and *outside growers*. Which of these two classes of plants is more directly important to us ?

Uses of the leaves to the *plant*.. The countless little mouths; the action of air and sunshine on the sap in the green leaf. The food of plants. How we know that the greater part, even of a great tree, was taken from the air by the leaves. How the leaf-stalk, the irregular form of the leaf, and the blowing of the wind, all help to feed the trees. Opposite effects of the respiration of plants and of animals upon air.

Plants as *herbs*, *shrubs*, and *trees*—examples of each. As *annuals*, *biennials*, and *perennials*—examples of each; perennial herbs (dahlia, sweet potato, artichoke, potato). Tubers and bulbs; what they are —examples.

4. A few lessons on the *reproductive organs* of plants should then follow; the *flower*, *fruit*, and *seeds*. Selections and limitations to be made by or under the direction of the Principal, or equivalent exercises on plants substituted by him. Flowers, common fruits, and engravings should be shown, and the blackboard should be frequently used. The flowers and their several parts form the chief basis of classification.

5. First show the parts of a blossom, taking a regular one to begin with—as a *lily*, a *morning-glory*, or a *buttercup*. Use also the blackboard for drawing and spelling. Analyze so that the pupils can see the parts, showing the *calyx* and *sepals*, the *corolla* and *petals*, the *stamens* with the *anthers* and *pollen*, and the *pistil* with its *ovary*. Give a sufficient number of exercises to make this familiar, and let the pupils analyze for themselves. The *principal forms* of flowers, as *bell-shaped*, *wheel-shaped*, *salver-shaped*, *cross-shaped*, *butterfly-shaped*, etc., may then be shown. The *arrangement* of the blossoms on the stem (inflorescence), as far as it can be exemplified by actual specimens, as *head*, *raceme*, *spike*, *umbel*, etc., may also be learned: incidentally, the importance of insects, especially bees, in carrying

pollen to the pistil, and the importance of the sweet fluid in the blossoms as a bait, and of the colors of the petals as a guide to the insects.

GENERAL OUTLINE OF CLASSIFICATION BY BLOSSOMS.

A. (Series.) *Flowering* (*phænogamous*) plants. Examples—*rose*, *lily*, *geranium*.

B. (Series.) *Flowerless* (*cryptogamous*) plants. Examples—*fern*, *moss*, *mushroom*.

Use only the *familiar* terms. Give other examples of plants in each series.

Flowering plants, two classes.

Outside-growing (*exogenous*) plants.

Inside-growing (*endogenous*) plants.

Familiar examples to be found by the pupils ; such as *rose*, *buttercup*, *geranium*, *pea*, *potato*, *grapevine*, etc., and *lily*, *Indian corn*, *common grass*, etc.

Illustrate by *stems*, showing the rings or annual layers of growth in the former, with *bark*, *wood*, and *pith*, and their absence in the latter class. Review the coincident peculiarities of the leaves, as *net-veined* and *parallel-veined*, which afford a ready method (approximate) of distinguishing these plants, thus giving opportunity for useful exercises; also those of the seeds, as of two-seed leaves, or only one.

Outside-growing.—Including, 1, orders or families of plants, with blossoms of *many petals* (*polypetalous*); and, 2, orders or families of those with blossoms of *one petal* (*monopetalous*). The pupils will readily find specimens of each, the popular names of which they have already learned.

Inside-growing.—The orders should not be taught. Nor need any instruction be given in relation to the classification of cryptogamous plants, *ferns*, *mosses*, etc., this being too difficult, and depending upon distinctions not sufficiently obvious for the purpose of these lessons. Attention, however, may, if occasion offers, be called to the *fructification* of ferns.

Such of the *orders*, or *families*, should be taught as are very familiar and depend upon quite obvious distinctions, familiar names being exclusively used. Thus the *mustard family*, the *pulse family*, the *crowfoot family*, the *rose family*, the *lily family*, etc., may be taught as far as the collection and presentation of specimens render it desirable; that is, not the mere fact that there are such families, but *in connection with an*

actual object, and in answer to an *inquiry about the family to which the object belongs.* If the season permits, and there is an opportunity for the pupils to seek for specimens, this part of the instruction may be extended. Here the judgment of the teacher (never to be superseded) must be carefully exercised, it being constantly kept in view that the object of these lessons *is not to make the pupils botanists*, but to create a basis for the study of natural objects, to develop the faculties of perception and reflection, and to cultivate facility of statement. *Species* need not be taught at all, although the pupils may, as occasion offers, be made to perceive the diversity presented by different individuals of the same family, so as to learn what is meant by species.

6. The *common uses of plants* may be taught to some extent incidentally with some of the above instructions, but more fully at this stage. This will embrace their uses for *food*, *clothing*, *medicine*, etc. Take our own plants first. Show that the *roots* of some plants are useful; of others, the *seeds;* others, the *leaves;* others, the *fruit;* others, the *bark*, etc. Some few plants of other climates and countries may then be referred to, as *cotton*, *rice*, *tea*, *sugar*, *coffee*, etc. The relationship of these plants to our own may then be shown; that is, the *families* to which they belong. Do not let these exercises become a mere repetition of a part of those of the Eighth Grade.

7. *Objects.*—The things necessary for the indispensable objective presentation of this subject have been already sufficiently indicated in the text. Good drawings may be used when the natural objects are not procurable.

8. *Reference.*—All that any teacher can possibly need for any part, or for the whole of these outlines, may be found in Gray's How Plants Grow, Hooker's Child's Book of Nature, and Buckley's Fairy Land of Science (articles on Bees and Flowers, and on Sunbeams and their Work). There are, besides, many other excellent popular works on botany.

SUFFIXES AND PREFIXES.

For the Sixth Grade, exercises in suffixes only are prescribed. For the higher grades both prefixes and suffixes are required. These exercises involve certain important changes in spelling as well as modifications of meaning. They should include only such words as the pupil may readily be trained to use in oral and written expression.

In order to insure systematic progress, lists of these words should be kept by the teacher.

The following groups of words are submitted as suggestive illustrations: *Pity, pitied, unpitied, pitying, pitifully, piteous, piteously. Sweet, sweets, sweeten, sweetening, sweetly, sweetness. Just, unjust, unjustly, justice, injustice, justify, justification.*

ARITHMETIC.

Written and *Mental.*—For suggestions see pages 32–35, and the following:

1. Particular care should be taken in the selection of examples that no one of them be so intricate and prolix as to consume a large amount of time, without affording proper exercise of thought in the application of arithmetical principles.

2. Too much importance, nevertheless, can scarcely be given to the requirement of rapid calculation in the simple rules of arithmetic. No part of the arithmetical discipline has a higher utilitarian value, whether for the purposes of practical life or for progress in the more advanced portions of the study; for nothing is more discouraging to the pupil than to find that, in any exercise involving other

than a few figures, his results are almost always incorrect, from a want of habitual accuracy in performing the simple combinations involved in the elementary rules. Teachers are, therefore, especially advised to employ every variety of proper stimulus to make the exercises for this purpose thorough and effective.

SYLLABUS OF TOPICS.

Principle of *Cancellation*.

Its *identity* with dividing by *common factors*, and with *reducing to lowest terms*. Show this by examples in fractions.

Examples of simple applications of cancellation to whole numbers.

Compound fractions defined and illustrated.

Multiplication of Fractions.

Multiplication of fraction by integer.

Multiplication of mixed number by integer. Teach both methods.

Converse of these two cases.

Multiplication of fraction by fraction.

Compound fraction same as this case.

Multiplication of mixed numbers and fractions. Generally reduce the mixed numbers to improper fractions; also, cancel before multiplying.

Note.—In this last case it is sometimes more convenient not to reduce the mixed number; as, $125\frac{3}{8} \times \frac{1}{2}$, $12\frac{3}{4} \times \frac{2}{3}$.

Examples to be given in a practical form at as early a stage as can be made expedient.

Find how many cents, or cents and mills, in a given fraction of a dollar.

Examples involving preliminary reduction to lowest terms.

Note.—It must not be forgotten by the teacher that, from the nature and definition of a fraction, every example in fractions must involve or relate to division in some way.

The following explanations and suggestions will be found useful:

Multiply $\frac{3}{7}$ by 12; 12 times $\frac{3}{7} = \frac{3 \cdot 6}{7} = 5\frac{1}{7}$.

Multiply $\frac{3}{8}$ by 12; 12 times $\frac{3}{8} = \frac{3 \cdot 6}{8} = 4\frac{1}{8} = 4\frac{1}{2}$. This result would be more readily reached by the cancellation of the common factor 4, in the multiplier 12, and the divisor 8. Whenever possible, cancellation should be used.

Find $\frac{3}{4}$ of 12; $\frac{1}{4}$ of $12 = 3$; $\frac{3}{4}$ of $12 = 3 \times 3 = 9$.
Find $\frac{3}{7}$ of 12; $\frac{3}{7}$ of $12 = \frac{1}{7}$ of 3 times 12 = $\frac{1}{7}$ of $36 = 5\frac{1}{7}$.
Find $\frac{10}{16}$ of 12. Use cancellation.
Find $\frac{8}{11}$ of $\frac{2}{11}$; $\frac{1}{4}$ of $\frac{8}{11} = \frac{2}{11}$; $\frac{3}{4}$ of $\frac{8}{11} = 3 \times \frac{2}{11} = \frac{6}{11}$.
Find $\frac{3}{4}$ of $\frac{7}{11}$; $\frac{1}{4}$ of $\frac{1}{11} = \frac{1}{44}$; $\frac{1}{4}$ of $\frac{7}{11} = \frac{7}{44}$; $\frac{3}{4}$ of $\frac{7}{11} = 3 \times \frac{7}{44} = \frac{21}{44}$.
Find $\frac{12}{16}$ of $\frac{6}{11}$. Use cancellation.

Division of Fractions.

Division of fraction by integer. Solve as compound fractions.
Division of mixed number by integer. Solve as compound fractions.
Converse of these two cases. (See below.)
Division of fraction by fraction. (See below.)
Quotients of mixed numbers and fractions. (See below.)
Examples in finding what part one fractional quantity is of another.
Complex fractions—best considered as cases of division of fractions.

The form of putting the questions should be varied as much as possible, so as to train the pupils to select and apply the right principle and method.

Introduce practical examples as soon as possible. The teacher should always keep in mind, and should impress on the pupils, that the analyses of such examples correspond exactly with those of similar examples in the Eighth Grade, the essential difference being that *fractional* numbers now take the place of integers.

Note.—The question: "If $\frac{4}{7}$ of a yard cost $\$\frac{3}{5}$, what will a yard cost?" involves the finding of the cost of $\frac{1}{7}$ of a yard.

"If $\$\frac{3}{5}$ buy $\frac{4}{7}$ of a yard, how much will a dollar buy?" involves $\$\frac{5}{5}$.

Give examples involving simple combinations of the multiplication and division of fractions; also addition or subtraction, with multiplication or division, like the following:

Bought $7\frac{3}{8}$ yards and $3\frac{1}{5}$ yards at $\$1\frac{2}{3}$ a yard; cost of the whole?

Bought 36 yards, kept $9\frac{1}{5}$ yards, sold the remainder at $\$\frac{2}{9}$ a yard; how much did I get for it?

If I had sold it for $\$7\frac{1}{2}$, how much a yard would that be?

If $\frac{3}{8}$ yard cost $\$\frac{5}{7}$, what will $\frac{8}{11}$ yard cost?

If $\frac{3}{8}$ yard cost $\$\frac{5}{7}$, how much can be bought for $\$5\frac{2}{9}$?

The following explanations and suggestions will be found useful:

Divide 9 by $\frac{5}{7}$ (first method), $9 = \frac{63}{7}$; $\frac{63}{7} \div \frac{5}{7} = \frac{63}{5} = 12\frac{3}{5}$.

Divide 9 by $\frac{5}{7}$ (second method), $9 \div \frac{1}{7} = 7 \times 9 = 63$; $9 \div \frac{5}{7} = \frac{1}{5}$ of $63 = 12\frac{3}{5}$. From this method it is seen that the dividend has been multiplied by 7, and the product divided by 5; or, in other words, the dividend has been *multiplied* by the *divisor inverted*. The method of

division by inverting the divisor is preferable, as it more frequently permits cancellation and thus shortens processes.

Divide 9 by $3\frac{1}{7}$. Reduce the divisor to an improper fraction.

Divide $\frac{3}{11}$ by $\frac{5}{7}$: $1 \div \frac{5}{7} = \frac{7}{5}$; therefore, $\frac{3}{11}$ of $1 \div \frac{5}{7} = \frac{3}{11}$ of $\frac{7}{5} = \frac{21}{55}$.

Divide $7\frac{3}{11}$ by $4\frac{5}{7}$. Reduce to improper fraction.

NOTE.—Teachers should remember that arithmetic is not only a *science*, but also a practical *art;* that this art involves important *devices*, many of which have been already taught, and their principles explained. These devices, such as reducing to lowest terms, cancellation, rejecting terminal 0s of a divisor, etc., should not be at any time lost sight of. Examples in the special subject of the grade should be occasionally given of such a character as to require these devices. The omission or neglect of these important matters will be a serious defect in the character of the instruction given.

It will be readily perceived that solutions which follow the steps of a logical analysis are much more tedious than those which follow a rule derived from the *result* of the analysis. The methods by analysis are essential to the proper teaching of the principles of arithmetical computation, but they should be employed in written arithmetic no longer than is absolutely required for the accomplishment of such a purpose.

GEOGRAPHY.

South America.—The geography of South America is to be studied only in outline. Great care must be taken from the outset that no part of the work be made so full as to prevent the *ready completion and thorough review* of the whole requirement of the grade before the promotion of the class to the next grade. The following are the essential points: The boundaries of South America; area and population in round numbers; simplest physical divisions, as in the United States; the names and relative positions of the several countries; brief statements of general facts relating to the climates and productions of the countries; the names and locations of their capitals, and of those islands, mountains, seas, gulfs, bays, rivers,

lakes, straits, and other physical features that have already been included in teaching the Western Hemisphere.

Europe.—The local and descriptive geography of Europe for this grade will include the following:

General boundaries of Europe; area and population in round numbers; simplest physical divisions, as in the United States; names of all its countries.

In relation to each country the following will be required: Relative position; large rivers, not more than one or two; large islands, and prominent capes and mountain chains (if there are any); one or two leading exports; the capital.

FIFTH GRADE.

Outline Course.

1. Language Lessons.—*Reading* of the grade of a Fourth Reader: *oral lessons* on the human body: *compositions* as before: *spelling*, *meaning*, and *use* of words, as before—at least 150 additional words, and review of all previously taught: exercises in *prefixes* and *suffixes*.

2. Arithmetic.—*Written* and *mental*.—Decimals, and practical applications of common and decimal fractions; also, reduction, ascending and descending, of integral denominate numbers.

3. Geography.—North America in outline, and the United States in detail.

4. History of the United States (without a text-book).—A brief general outline.

5. Penmanship.—Phrases and sentences varying in length and degree of difficulty.

6. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw a regular pentagon. Draw two varieties of trilobate conventional leaves and two conventional flowers. One Greek vase without perspective effect or ornament, not less than five inches in height. Two examples of historic ornament (borders), Egyptian and Greek. One original border, composed of the leaves and flowers used in this or the Sixth Grade. One original combination of the above leaves and flowers in a square; repeat the square for wall-paper or oil-cloth design.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for
Reading, found on page 20; those for
Spelling, on page 29; those for the
Meaning and Use of Words, on page 31; those for
Composition, on page 28; and those for
Prefixes and Suffixes, on page 91, are to be taken as belonging to this grade also.

ORAL LESSONS.

On the Human Body.

1. The chief purpose of this study in the Grammar Schools is to give useful *practical knowledge of the laws of health.* As this subject receives, at most, but a small part of the time of a single grade, it is the more important that only those parts of it should be considered that are essential to the main purpose.

2. The teacher will observe that Anatomy, which occupies so much space in many text-books, is not called for in this grade, except as far as it is necessary to teach what is specially prescribed. It is a matter of little consequence to the pupil to know exactly the number of bones, or vertebræ, or of pairs of muscles in his body, or to repeat their

scientific names. Only those anatomical terms and facts should be introduced that are inseparable from the main subject (*physiology and hygiene*).

3. *Oral description* of structure or function should take the place of *definitions*. These should be omitted altogether.

4. The appliances necessary for teaching this branch are the blackboard and charts. The teacher should carefully consider, at every step, to what extent the subject can be treated objectively. This can, in part, be done by drawing the pupil's attention to his own body, as in case of the joints, the pulse, the veins, arteries, respiration, etc. For several very important parts of the subject, there is no better apparatus than that which can be procured without expense at any butcher's stall—such as the lungs and windpipe of a sheep; the diaphragm; the heart and part of the great tubes leading to and from it; the brain and the bony cavity which contains it; the eye; portions of the spinal cord and nerves; small glands; and portions of limbs showing the relations of muscles, tendons, ligaments, and joints. None of these need present anything offensive or disgusting. Add to these a small knife and proper preparation on the part of the teacher, and the instruction given will be both interesting and profitable.

5. A *syllabus* of leading points is subjoined. It is not required that all these should be taught in one class, though all are important. Neither is it expected that any point shall be treated exhaustively, nor is the teacher obliged to follow exactly the order laid down. Any order (so that it be an *order*) which presents the parts of the general subject in their natural relations will be satisfactory.

SYLLABUS OF TOPICS.

The pupil should be led to look upon the body as a complex apparatus for the use of the mind. To know that it consists primarily of—

First, a bony framework (the skeleton); *Second*, a motor apparatus attached to the frame (the muscular system); *Third*, a directing apparatus by which the mind controls the body (brain and nervous system and sensory organs); *Fourth*, a general envelope protecting the preceding, as well as serving other purposes (the skin).

He should then be led to see that every motion of the body or of its minutest part, however slight, and whether voluntary or involuntary, requires the destruction of a minute part of the organism and the removal of the destroyed part from the system—that this constant destruction and removal make necessary a corresponding *reconstruction* and *renewal*, by means of new material, and that for these purposes there are provided—

Fifth, a circulatory apparatus—(the blood-vessels)—to carry away old material and to distribute the new; *Sixth*, an aerating apparatus (the respiratory system), to purify, warm, and enliven the circulating fluid; *Seventh*, a system of drainage (the skin and kidneys), to take from the blood a large part of the worn-out material; and *Eighth*, an apparatus to prepare and supply the new material (the digestive and assimilative organs).

Under each of these heads a few points are noted:

1. *Bones*—their composition and various uses; the covering membrane; *joints*, their various uses and lubrication—important peculiarities of the spinal column, cautions as to injuring the large bones of an infant; the repairs of broken bones. Compare *briefly* with corresponding arrangements in cow, fowl, turtle, fish. See charts.

2. *Muscles and Tendons*—their appearance and uses—arrangement of the muscles in pairs, and why; how attached, how able to contract; effects of exercise; use of calisthenics.

3. *Nervous System*—means of becoming conscious of the external world—spinal cord—its importance and protection—its many pairs of branches—effects of severing or injuring the spinal cord; care of infants in this respect. The sympathetic system, the nerves (as telegraphic wires), the brain and its principal functions; uses of pain—uses of sleep—excitement, caution against—late hours, stimulants, etc.

Special Senses—touch, papillæ—taste—smell—the ear, its mechanism, hearing—the eye, its mechanism, sight—injury of the eye by misuse.

4. *Skin*—its structure and uses. Perspiratory glands and tubes—uses

of perspiration—importance of bathing, misuse of bathing ; importance of proper clothing—sympathy of skin with lungs—with digestive organs—caution against exposure of limbs, arms, or chests of little children ; the skin as an absorbent—danger of cosmetics and hair-dyes ; treatment of burns and scalds, etc.

5. *Circulation*—general relations of heart, arteries, veins, and capillaries—valves, where and use—pulse—its rate—rapidity of circulation. Effects of fresh air and exercise on the circulation ; limits of exercise—dangers of excessive rope-jumping, etc. Effects of sleep ; cautions necessary—effects of tight garments—of scanty garments—of insufficient or improper food. Wounds—how to know when an artery is wounded, and what to do.

6. *Respiration.*—Practically the most important department of hygienic knowledge. The apparatus—how protected—arrangement of ribs for flexibility and the expansion of the lungs—muscles of chest and diaphragm concerned in respiration ; importance of the diaphragm ; show its positions at beginning and end of inspiration ; the trachea ; the organ of the voice—minute structure of lungs—the cells and their membrane—exosmosis and endosmosis simply stated without using the terms ; intimate relations of capillaries and air-vessels ; frequent full inspiration a means of increasing the capacity of the lungs ; exercises that will ensure this ; pernicious effects of tight lacing on the capacity and action of the lungs. The air—its composition—relations of oxygen to carbon and hydrogen introduced with food—products of respiration all invisible except water—poisonous nature of carbonic acid when inhaled—in wells—in vats—effects of smaller quantities ; other poisonous substances thrown off by lungs and skin—effects of tobacco, onions, liquor, teeth, etc., etc. Rapid diffusion of gases and vapors—ventilation of class-rooms—of sleeping-rooms—simple devices for ventilation of small sleeping-rooms in winter—why called "*vital air*"—careful inspection of premises to remove all decomposing substances, etc.; foul air from cellars, sewers, sinks, water-pipes, garbage, gas-lights, stoves, etc.; brief but distinct statement of the *germ theory* of disease, as in diphtheria, scarlet fever, cholera, yellow fever, etc.; simple and cheap disinfectants —chloride of lime—chlorine—sulphate of iron—carbolic acid—sulphur, whitewash, etc. Respiration as affected by position in standing—in sitting—especially in sitting to write or to draw ; importance of proper *habits* in this. Popular errors in regard to condition of drowned persons—proper treatment for their resuscitation.

7. The digestive apparatus—the teeth, their uses, structure, and hygiene—brief notice of salivary glands, their position and uses—of the

gullet—structure and function of the stomach—brief notice of the duodenum, the intestines, lacteals, etc.—importance of the liver—the link between the digestive and circulating systems. Dyspepsia, its preventable causes and serious consequences—importance of chewing the food—of regular hours in eating—of light suppers—of good cooking—the art of preparing wholesome food the most important of household arts—common errors to be avoided in the preparation of food. Common poisons and their antidotes.

REFERENCE BOOKS.—Any of the numerous excellent manuals on Physiology; History of a Mouthful of Bread, and The Servants of the Stomach, by Jean Macé; Appleton's Health Primers; Hooker's Child's Book of Nature; articles Digestion, Respiration, etc., etc., in Appletons' American Cyclopædia.

ARITHMETIC.

Suggestions for *mental* and *written* arithmetic, as in preceding grades. Also

1. Definitions pertaining to fractions should be retained and occasionally reviewed.

2. The exact nature of decimal fractions should be explained and illustrated; also the meaning of the word *decimal.* Show that decimal fractions may be used like common fractions by writing the denominator. Illustrate by the decimal notation, showing that whole numbers greater than 9 are also expressed *decimally.*

3. The illustrations may embrace the following: 1. How to write decimals, as 7-tenths, 7-hundredths, 7 thousandths, 7-ten-thousandths, etc. 2. Show that the *numerator*, as in common fractions, is written FIRST. 3. Show that the "decimal point" and the ciphers, when used, are only required to *indicate* the *denominator.* 4. In *reading* decimal fractions the pupils should be cautioned to avoid such expressions as "tens of thousands" for *ten-thousandths*, "hundreds of thousands" for *hun-*

dred-thousandths, etc., etc. In connection with the reading of such fractions, pupils should be trained to recognize readily the comparative value of different fractions; as, that .3 is greater than .0987, or .01 than .009596, etc. They may also be made to perceive readily the *approximate value* of decimals as compared with simple common fractions; as that .7634 is a little more than $\frac{3}{4}$; that .8741 is somewhat less than $\frac{7}{8}$, etc. Previous to this, however, it is well to teach the exact value of certain decimal expressions; as, $.75 = \frac{3}{4}$, $.125 = \frac{1}{8}$, $.375 = \frac{3}{8}$, etc. These exercises will serve to render the subsequent work of the pupil intelligible.

SYLLABUS OF TOPICS.

READING decimal fractions.

Exercises in telling how many places are necessary for a given denominator, and *vice versa*.

WRITING decimal fractions.

Reduction of decimal fractions:

1st. *By inspection*, with analysis as in common fractions.

Examples, mental and written.

.3 to .00's, to .000's, etc. .15 to .00000's.

.3 to .0's, to .00's, to .000's, etc. 7.3 to .0's, to .000's, etc.

Reduce .700 to *lowest* DECIMAL *terms*.

Reduction of common fractions to decimal fractions. Give analysis.

Use principle—$\frac{3}{4}$ of $1 = \frac{1}{4}$ of 3.

Reduce $\frac{3}{4}$ to .0's—$\frac{3}{4}$ of $1 = \frac{1}{4}$ of $3 = \frac{1}{4}$ of 30 tenths $= .7\frac{1}{2}$.

Similarly, 3 is how many tenths of 7?

NOTE.—Pupils should be accustomed to read decimal fractions, especially hundredths (in subsequent grades applied to per cent.), so as to include outstanding fractional parts, where there are any.

Example.—Reduce $\frac{4}{11}$ to .00's.

$\frac{4}{11} = \frac{1}{11}$ of 4 $= \frac{1}{11}$ of 4.00 (four hundred hundredths) $= .36\ \frac{4}{11}$.

Reduce $\frac{240}{320}$ to a decimal: $\frac{240}{320} = \frac{24}{32} = \frac{3}{4} = \frac{1}{4}$ of $3 = \frac{1}{4}$ of $3.00 = .75$.

NOTE.—Give example to show that common fractions in their lowest terms can be made *entirely decimal* only when every prime factor of their denominators is either 2 or 5. In the general work of the class,

pupils should rarely be required to continue the division beyond three or four places.

Reducing Decimal Fractions to Common Fractions in their Lowest Terms.

Rule.—Write the fraction as a common fraction and reduce to lowest terms.

Examples: .625, .4125, .87500, 14.125.

Examples: .07$\frac{1}{7}$, .3$\frac{1}{3}$, .66$\frac{2}{3}$, 5.11$\frac{1}{9}$, .87$\frac{1}{2}$.

Examples of this class may be solved very simply as follows:

.07$\frac{1}{7}$ = 7$\frac{1}{7}$ × $\frac{1}{100}$ = $\frac{50}{7}$ × $\frac{1}{100}$ = $\frac{1}{14}$.

NOTE.—Pupils should be made thoroughly familiar by rapid mental exercise, usually without analysis, with the decimal expressions for halves, 3ds, 4ths, 5ths, 6ths, 7ths, 8ths, 9ths, 11ths, 12ths, and *vice versa*, using preliminary reduction to lowest terms whenever possible, as in $\frac{50}{125}$, $\frac{6}{9}$, etc.

Addition of Decimal Fractions.

Examples: Add .2, .05, .008, .7283. Add .0005, .97, .0101, etc.

Examples: Give mixed numbers.

NOTE.—Explain, as in common fractions, by principle of least common denominator; the necessary additional ciphers may be "understood" in the solution.

Subtraction of Decimal Fractions.

Examples: .1 − .075; 1.001 − .01009, etc.

Explain as in common fractions, with the same analysis.

Multiplication of Decimal Fractions.

NOTE.—Do not give large denominators; *use the brief rule of common fractions.* *Cases* as in common fractions:

1. When a fraction or a mixed number is to be *multiplied;* as,
   4 times .75, 17 times 8.047, 100 times 9.625, 1,000 times 1.3.
   Value of 13 barrels at $8.375 a barrel?
2. When a *fractional part* is to be taken; as,
   .4 of .83, .4 of 75, .4 of 8.75.
   How much is .7 of $38.45? .079 of $120? .90$\frac{1}{4}$ of $160.48?
   Value .179 of ton @ $92 a ton? at 92.87\frac{1}{2}$ a ton?
3. Combinations of the 1st and 2d cases; as,
   3.4 lbs. at 79 cts. a lb.? $.79 × 3.4;
   8 cwt., 75 lbs. @ $2.47 a cwt.? $2.47 × 8.75.

NOTE.—As preliminary to 2d and 3d cases, give mental exercises in finding the *product* of two decimal denominators, as 10ths by 10ths, how many decimal places? 1000ths by 100ths, how many decimal places? etc.

Examples of cases involving reduction:

$.024 \times .15 = ?$ Product of numerators, $24 \times 15 = 360$, the new numerator; $1000 \times 100 = 100{,}000$, the new denominator. Ans. .00360 = in lowest decimal terms, .0036. Why cross off the last 0? To divide both terms by 10.

NOTE.—Many questions are as well solved by the application of a principle in common fractions, as follows:

0.79 of \$14.83 = .001 of 79 times \$14.83, etc.

Use or not, as may be judged expedient.

Division of Decimal Fractions.

There are two cases:

1. When the divisor is *an integer*—

$7 \div 8$, $8 \div 7$, $6 \div 5$, $6 \div 120$, $7.2 \div 6$, $3.6 \div 120$, $3.6 \div 100$, etc. Put question in several ways: 1st. Divide 7.2 by 6. 2d. How much is $\frac{1}{6}$ of 7.2? 3d. How many times is 6 contained in 7.2? etc.

2. When the divisor is, or contains, a decimal fraction:

$6 \div .03$, $.8 \div .005$, $.004 \div .8$, $.0036 \div .024$, $7.2 \div .009$, $8 \div 5.45$, $3 \div 7.203$, $.2 \div 8.75$, $.3006 \div 7.4$, $8.5 \div 9.78$, $8.638 \div 9.5$, $8.638 \div 4.3$, etc.

All examples under this head are reducible to the first case by multiplying divisor and dividend by the same number, or by moving the decimal point of the divisor to the right until it becomes an integer, and moving the decimal point of the dividend to the right a corresponding number of places.

NOTE.—As a substitute for the above the following may be employed if preferred: Show that, when the dividend contains a *less* number of decimal figures than the divisor, the method of reducing to a common denominator, or *same denomination*, may be applied. Also show that, when the dividend contains *more* decimal figures than the divisor, the number of decimal places in the quotient must be the *excess* of those in dividend over those in divisor.

Applications.—The most important applications of decimal fractions will be found in Federal money. Simple combinations with common fractions should occasionally be made; also simple combinations of two or more of the rules of decimal fractions.

Use the principles of *cancellation* and *reduction to common fractions* whenever they will simplify the operation. It would be a *defect*, in a class that had completed multiplication of decimal fractions, to go through the long process when finding .125 of a number. If properly taught, they will know the value of that fraction to be $\frac{1}{8}$, and will proceed accordingly.

Examples in finding what *decimal fraction* one number or quantity is of another; especially how many *hundredths*—use ONLY small amounts or very simple examples:

8c., how many hundredths of 64c.? $7.25, how many hundredths of $9.75?

Solutions as follows:

1st. What common fraction: $\frac{8}{64} = \frac{1}{8} = ?$ $\frac{725}{975} = \frac{29}{39} = ?$

2d. What decimal fraction: $\frac{1}{8} = .125$ or $.12\frac{1}{2}$; $\frac{29}{39} = .74\frac{4}{9}$.

The last case is the extreme limit of "applications" in this grade, in which the example should *never* take the following involved form of statement: "Bought for $9.75, sold at $7.25 profit, how many hundredths did I gain?"

General Remarks.—It must not be forgotten that the teaching of *principles* and their most common and useful applications is the principal matter in the study of common and decimal fractions. Therefore, AVOID LONG EXAMPLES.

Reduction of Integral Denominate Numbers.

In the reduction of integral denominate numbers, only the most practical of the weights and measures should receive attention in this grade. Teach in the following order: Avoirdupois weight, Troy weight, Linear measure, Surface measure, Solid measure, Dry and Liquid measures. Time. See that the tables are not only memorized, but understood.

Reduction Descending.—Why so called.—Denominations always written.—Do not allow pupils to "add in" by a separate line; it greatly increases the work and the time, and indicates mental feebleness. Explain by any process which makes the multiplier an abstract number. The "adding in" is identical with that in the reduction of mixed numbers. When the question will allow it, insert frequently the finding of the value at a given price.

Reduction Ascending.—Best taught and understood in immediate connection with reduction descending; at first by reviewing the same example. Do not allow long division by divisors less than 13; nor if cutting off 0s will change to short division.

Explain by any process which will clearly account for the denominations of the successive quotients and remainders.

The necessary analyses have already been given in the preceding grades.

Give examples in finding the quantity purchased for a given sum of money at a given price for some small quantity, such as a pint, an ounce, a foot, etc., etc.

Supplementary Note to the Arithmetic of the Seventh, Sixth, and Fifth Grades.

Particular attention is directed to the three following elementary and mutually related problems, and to their importance as the essential preparation for the commercial arithmetic of the third and higher grades.

1st. To take a fractional part of a given number:

Seventh and Sixth Grades.	*Fifth Grade.*	*Third Grade.*
How much are $\frac{2}{3}$ of 15 ?	How much are .75 of 15 ?	Find 75 per cent. of 15 ?
How much are $7\frac{1}{8}$ times $9\frac{1}{2}$?	How much are 3.48 times 7.53 ?	Find $62\frac{1}{2}$ per cent. of 8.75 ?
Value of $4\frac{2}{3}$ yards @ $\$5\frac{4}{7}$ a yard ?	Value of 8.47 tons @ $3.45 a ton ?	Find $87\frac{1}{2}$ per cent. of $\$48.37\frac{1}{2}$?

2d. To find what (fractional) part one given number is of another given number:

6 is what com. fract. of 15 ?	6 is what dec. fract. of 15 ? 6 is how many 100ths of 15 ?	6 is what per cent. of 15 ?
$7\frac{1}{8}$ is what com. fract. of $9\frac{1}{2}$?	$7\frac{1}{8}$ is what dec. fract. of $9\frac{1}{2}$? $7\frac{1}{8}$ is how many 100ths of $9\frac{1}{2}$?	$7\frac{1}{8}$ is what per cent. of $9\frac{1}{2}$?
$\$4\frac{2}{3}$ are what com. fract. of $\$5\frac{1}{4}$?	$\$4\frac{2}{3}$ are what dec. fract. of $\$5\frac{1}{4}$? $\$4\frac{2}{3}$ are how many 100ths of $\$5\frac{1}{4}$?	$\$4\frac{2}{3}$ are what per cent. of $\$5\frac{1}{4}$?

3d. To find the number of which a given number is a given fractional part:

85 is $\frac{5}{8}$ of what number ?	85 is .625 of what number ?	85 is $62\frac{1}{2}$ per cent. of what number?
$2\frac{1}{8}$ is $\frac{7}{9}$ of what number ?	18.75 is 1.3 of what number ?	$8\frac{3}{4}$ or 8.45 is 11 per cent. of what number ?
$\$8\frac{1}{7}$ are $\frac{4}{5}$ of what sum ?	$9.25 are 1.25 of what sum ?	$12.60 are $87\frac{1}{2}$ per cent. of what sum ?

If these three principles are made reasonably prominent by simple practical examples in the Seventh, Sixth, and Fifth Grades, a large part of the time and labor of the teachers of the higher grades will be available for other equally important objects.

GEOGRAPHY.

North America.—The *outline* of North America will include its boundaries; area and population in round numbers; simplest physical divisions; the names and boundaries of its countries; a few facts in regard to Greenland and Iceland; Canada—the names and boundaries of its Provinces and Territories, its chief rivers, lakes, and other bodies of water, chief capes, mountains, and islands, its climate, people, form of government, language, chief exports, its capitals, and other large or important cities and towns. Corresponding points in regard to Mexico as a whole, the States of Central America, and the islands of the West Indies. In the simplest and most general way, the leading articles, if any, exported to the United States, and the articles we send in exchange.

United States in Detail.—1. In teaching the geography of the United States, it is particularly important that the time of the pupil be not exclusively taken up by the study of mere local details—by learning the several courses, etc., of long lists of rivers, and the exact situation of still longer lists of towns. A certain, but limited, amount of local geography is indispensable as a basis for the more important descriptive geography.

2. The necessary *local geography* embraces the names of the several States and Territories and their division into several groups, as New England, Middle, etc., etc.; their boundaries or relative positions; their important rivers, lakes, bays, capes, islands, mountain ranges and peaks; the capital of each State, and a few of its other cities or towns, if of any importance. All these should be carefully learned as a basis for the subsequent portions of the

study. For review of local geography, the rapid sketching of maps from memory is the best general test.

3. *The descriptive geography* should include the simplest physical outlines of the country as a whole; the great mountain ranges, plateaux, and plains; the drainage on the Atlantic slope by single rivers, and by extensive complex systems in the remainder of the country; the climate, with its modifications in the several sections, as cold or hot, wet or dry; the leading industries and the staple agricultural, mineral, and manufactured productions, and their dependence upon the physical conditions.

4. Add to this a simple and very brief outline of the general and State governments, the population, its four races and their distribution; the great commercial routes, natural or artificial, and the cities, as the centres of manufacturing and commercial industry.

5. The descriptive geography of *individual States or Territories* may then, in great part at least, be deduced from a consideration of these general facts. All tiresome sameness and repetitions will thus be avoided, and the pupil will be made to appreciate the real importance of the study.

HISTORY OF THE UNITED STATES.

General Suggestions.—1. The *leading purpose* of this study is, that the pupil may understand the origin, character, and condition of the nation of which he is a part, and that he may be fitted for an intelligent exercise of his duties and responsibilities as a citizen.

2. It is obviously impossible to treat so comprehensive a subject exhaustively: the immaturity of the pupil's mind and the pressure of other studies alike forbid. Yet the

leading facts and principles may be readily comprehended and remembered, and the outline which he is to retain may be made coherent and definite.

3. To this end a *brief general outline* should be carefully fixed in the minds of the pupils of the Fifth Grade, and be *reverted to frequently in the reviews in all the higher grades.* This outline can be given most expeditiously and efficiently by means of oral instruction and the use of the map: it should be very brief and simple, all detail being reserved for subsequent study.

4. The following outline is presented as illustrative of this suggestion. Its modification, or the substitution of another in its place, is left entirely to the discretion of the Principal.

Brief General Outline.

1. The people of the United States, excepting the Negroes, Indians, and Chinese, are of European descent.

2. Four hundred years ago our ancestors knew nothing of the existence of this Continent.

3. Spain, guided by Italian genius, led the way to its discovery, exploration, and colonization.

4. The first permanent English settlement within our limits was not effected until more than a century after the voyage of Columbus. In the interval, Spain and Portugal had possessed themselves of the shores and islands of the Mexican Gulf, and of nearly all South America.

5. For a century and a half the English colonies were confined to a narrow strip east of the Alleghanies.

6. Spanish slavery exterminated the Indians of the West Indies. This led directly to the opening of the African slave trade, and indirectly to the introduction of slaves into our own country.

7. The colonists had wars with the Indians in whose country they had settled, and with the neighboring French colonists. The English were successful and took possession of the territories formerly controlled by the French.

8. Less than a century ago all European settlements were yet dependent colonies.

9. The necessities of distant colonial settlements gradually developed in the English colonies a spirit of self-reliance and of political freedom, and a system of local and elective self-government.

10. The expenses of the French wars left a heavy debt and led to unusual taxation. A tyrannical system of taxation led to the War of Independence, which fixed the national boundary at the Mississippi. The colonies became States.

11. The present form of government (the Constitution) was established soon after the close of the war, nearly a century ago.

12. The number of States has been greatly increased by immigration and emigration. The population and wealth have vastly increased.

13. By purchase, and otherwise, the national territory has been extended to the Gulf of Mexico, and to the Pacific and Arctic oceans.

14. Since the War of Independence there have been three important wars: 1, *a war with England*, in defence of naturalized citizens, and in vindication of the rights of neutrals; 2, *a war with Mexico*, resulting from our annexation of Texas; 3, *a great civil war*, arising in part from questions originating in our colonial history, and in part from more recent causes.

5. The oral lessons in History given to the Fifth and Fourth Grades should be familiar and conversational. In the higher grades the lessons from text-books should be assigned by topics and not by pages.

6. All verbatim recitations of sentences and paragraphs should be strictly forbidden, and the pupils should be required to state the facts in their own language.

7. Only such dates should be committed to memory as are indispensable as landmarks in history. The *sequence* of events, rather than the precise date of each, is what is usually necessary.

8. Maps should be used in all grades, whenever the subject admits of their use.

9. Historic episodes, however interesting, should not receive the careful study given to the essential narrative. The stories of Juan Ponce de Leon, the conquest of Mexico, De Soto's Expedition, John Smith, Pocahontas, the

Salem Witchcraft, etc., should indeed be carefully read, and, as far as may be necessary, explained; but, unless great care is taken by the teacher, the pupils will be apt to conceive that these are the most important portions of the history.

10. Important incidental allusions to European history, such as the rise of the English Puritans, the expulsion of the Stuarts, the French Revolution, etc., should be carefully but briefly explained. Great care must be taken throughout to state all facts in such a manner as not to wound religious or political sensibilities.

11. Reviews of the portion already taught, with frequent references to the *brief general outline*, are of the highest importance. These reviews should take three distinct forms: the *Chronological*, the method usually followed in the text-book; the *Biographical*, requiring the pupil to state all that has been learned in regard to particular individuals; and the *Geographical*, requiring a statement of all important facts relating to the history of a locality. Many of the topics treated by the second and third of these methods necessarily become cumulative. For instance, the facts relating directly to Washington will be gathered from at least three distinct and important periods in our history. A connected statement of the important events that have taken place in Philadelphia, or in the valleys of the Hudson and Lake Champlain, or in the State of Virginia, will necessarily cover a large part of the general subject in the higher grades. Such statements must of course be brief, and frequently will be mere synopses.

Many of these reviews, and certain parts of the regular recitations, may be made spirited general exercises for the whole class by the use of the slate or paper. The writing

of the few essential dates, the sequence of important events, the names of important individuals, etc., are instances. The narrative reviews will necessarily be for the most part oral.

It will be observed that the system of reviews above suggested must, if faithfully carried out, result in a thorough unifying of the general subject in the mind of the pupil.

FOURTH GRADE.

General Outline.

1. Language Lessons.—*Reading* of the grade of a Fourth Reader (a different book from that of the Fifth and the Sixth Grade): *oral lessons* on common minerals and metals: *compositions* as before: *spelling*, *meaning*, and *use* of words as before—at least 150 additional words, and review of all previously taught: exercises in *prefixes* and *suffixes* continued: *English grammar* (without text-book)—the construction of sentences, with a view to develop a knowledge of the parts of speech, and to illustrate the terms subject, predicate, and object.

2. Arithmetic.—*Written and mental.*—Denominate numbers completed, with practical applications.

3. Geography.—Review of the United States; other parts of North America in detail, and Asia and Africa in outline.

4. History of the United States (without text-book).—Outline with greater detail.

5. Penmanship.—Writing in copy-books continued; practice in large and small writing.

6. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw the spiral. Two varieties of conventional lobed leaves and two flowers. Combinations of the leaves and flowers of this grade in a geometric form. Two examples of bi-symmetrical ornament, mediæval and moresque. Two original examples of surface covering, using the leaves or flower forms of Fifth Grade. One vase, not less than five inches, without perspective effect, ornamented, using the spiral.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for READING, found on page 20; those for SPELLING, on page 29; those for the MEANING and USE of WORDS, on page 31; those for COMPOSITION, on page 28; those for PREFIXES and SUFFIXES, on page 61; and those for HISTORY, on page 78, are to be taken as belonging to this grade also.

ORAL LESSONS.

ON MINERALS.

1. The "General Suggestions" found on pages 22–25 are to be taken as indispensable to this grade also.

2. In no other department is it so completely within the power of the teacher to present the subject to the *perceptions* of the pupils while in the class-room. Though the objective method is peculiarly applicable to this branch of oral lessons, no other branch requires so large a share of imparted information. This, however, should not be given by the teacher until nothing more can be drawn from the pupils. Draw out first what they can readily be led to discover or perceive, and then any other facts that they may remember to have read or to have heard.

3. Points that should be specially looked up and prepared for are suggested in the syllabus given below. A sufficient amount of detailed and very valuable and interesting information may readily be culled from Dana's "Manual of Mineralogy" and similar text-books, and particularly, under their several heads, from articles in Appleton's and other cyclopædias. See, for instance, Salt, Sulphur, Mica, etc.

Read also in Buckley's "Fairy Land of Science" the very interesting and instructive articles, "A Drop of Water on its Travels;" "The Two Great Sculptors, Water and Ice;" "History of a Piece of Coal," and Tyndall's "Matter and Force."

4. What has been said in preceding grades, as to the propriety or necessity of attempting only a part of the subject, is equally applicable here. Make such selections from the syllabus as may be thought advisable. What is done should be systematic. Do not attempt to treat any topic exhaustively. A large part would not be understood or remembered, and valuable time would be misapplied. A properly prepared note-book (see page 25) is indispensable.

5. Be particular to avoid reviewing a topic so often as to destroy the pupil's interest. As these exercises are to be simply *lessons on minerals*, and *not* in systematic *mineralogy*, the terms *form*, *structure*, *cleavage*, *hardness*, *weight*, *color*, *lustre*, etc., need be used only occasionally, and as the topic may make necessary. When any such term is used it should be carefully illustrated and explained, but not defined.

6. Begin with *Minerals—rocks*, as mineral aggregates, to be considered afterward. A clear perception of the general properties of minerals may readily be given by

commencing with *water*, as *water—ice—steam*. *Air* should follow next, so as to lead the way to some idea of the vast amount of gas locked up in the rocks.

7. As a preparatory step, lead the pupil to form some idea of the variety of forms of crystals, by briefly comparing, objectively, of course, *salt*, *alum*, *borax*, *quartz*, *mica*, *rock candy*, and other easily procurable crystals, all of which should be carefully labelled. I tis not here necessary to *name* any of the substances to the pupil.

8. In treating of *ice*, draw attention, *not by telling, but by proper questioning*, to its transparency, color, lustre, weight, solidity, hardness, fracture, and especially to the needle-like *crystals*, which can be so readily shown in ice-films when water is beginning to freeze, and in the frost flowers on the window-panes. Lead him now to see that a block of ice, or a snow-bank, must be made up entirely of such crystals, even though their individual forms are no longer perceptible. The application to other solid masses is obvious.

9. Show that many fluid substances, as in the case of water, upon *losing their heat*, crystallize into definite solid forms under favorable conditions, as in melted sulphur, and in the beautiful zinc crystals which cover the surface of so-called galvanized iron, a piece of which is an easily procured and a desirable "object." A sheet of common tinned iron (tin) after being heated and then washed with nitro-muriatic acid, reveals even more brilliant crystals. Dwell somewhat upon these easily shown phenomena of crystallization, and draw special attention to the mysterious and *indestructible force* which somehow rebuilds the molecules of water or of salt into the *same forms*, no matter how often the ice may be melted or the salt dissolved. Few topics are better fitted to awaken

thought and to develop in the young mind a permanent *desire to know*.

10. It will also be profitable, as well as interesting, to show that crystals are often formed from *substances in solution*. Alum, salt, or borax will furnish ready and simple means of illustration. With sulphur, salt, zinc, alum, etc., as with ice, the crystals may become so massed as to be no longer individually distinguishable.

11. *The principal points* to be fixed in such a lesson on crystals are, that there are *many kinds* of crystals, some formed from liquids which have become solid by a *loss of heat*, and others that were deposited *from solution*. These simple facts will be found of great importance in further treating the subject. They should not be imparted by telling, but by means of the pupil's own observation.

12. The pupil is then prepared to compare ice with a *quartz crystal*, which should be presented, but *not at first named*—compared first as to the resemblances, then the differences. When the pupils can be made to furnish no more ideas, the teacher should state where quartz is found, its relative abundance, geological importance, economic uses, etc. Be particular *not to introduce* an unexplained term—such as the NAME of any rock or mineral, as gneiss, or gypsum. The name means nothing until explained as quartz has been. A few other forms of quartz may then follow, each treated in the same way, and each in its turn briefly compared with those that have preceded it. This will constitute an excellent review, and will thoroughly fix what has been already taught.

13. That so many apparently different substances can possibly be only different forms of one and the same substance, quartz, may be readily illustrated by referring to

sugar, another crystallizing substance and well known to the pupil under many forms, solid and liquid.

14. Encourage the pupils to look for and bring in specimens which they think to be of the same character as those studied. *Let them tell* why they think they are the same. *Let others tell* why they think they are not.

15. Having thus treated of *quartz*, next consider, in the same way, *feldspar* and *mica*. The pupils will now be ready to consider a *rock*. Suppose it to be gneiss or granite. Let the pupils look for the minerals in it [a cheap single lens as a magnifier will often be of service]. Then consider the texture, structure, where found, uses, etc. The mineral *hornblende* and its important varieties may then follow, and after that the rock *syenite*.

16. A list of the more important topics suitable to this grade and taken mostly from Dana, is subjoined. From this the teacher will make such selections as the Principal may direct. A few of these are also given below, with brief synoptical notes, for the purpose of illustrating a proper form of note-book.

17. The qualities, sources, and uses of *common minerals* and *metals* should form the *chief substance* of these lessons:

MINERALS.

Water, air, carbon, diamond, coal (anthracite, bituminous), lignite, jet, plumbago, amber, petroleum, asphalt, sulphur, saltpetre, salt, borax, lime, gypsum, alabaster, chalk, stalagmites, lime-stones, crystalline and compact marbles, quicklime, hydraulic lime, alum, talc, soapstone (French chalk), meerschaum, hornblende, corundum and emery, feldspar, garnet, mica.

METALS.

Mineralized (ores) or Native—Ores of tin, iron, nickel, zinc, lead, mercury, copper, gold, silver, platinum. Enter into no *details* of Metal-

lurgy—a few simple facts in regard to smelting, fluxes, etc., will not be out of place. The economic uses of these metals and the poisonous properties of some of them should receive very careful attention.

Rocks.

As single Minerals.—Example, pure Limestone. As compounds—granite or pudding stone. Rocks as crystalline and non-crystalline; stratified and unstratified; aqueous, igneous, and metamorphic.

Characters and uses of important Rocks.—Granite, syenite; gneiss, mica—slate, talc, steatite, trap, basalt, lava, pumice; slate; quartz rock, buhr-stone, sandstones, conglomerates; limestones, marbles; sand, and clay.

Such of these rocks as are found on Manhattan Island, and in its vicinity, or as have important uses in paving, flagging, building, etc., should receive particular attention.

Synoptical Notes from Note-Book.

Water as a mineral. Solid, liquid, gas (steam). Effects of heat and of loss of heat. Properties as a mineral; transparent, tasteless, odorless. As a solvent; uses to vegetable life; to animal life; to mankind; found in all rocks and soils; small underground streams; wells and springs. Miscellaneous: droughts, floods, clouds, rain, rainbow; beneficial and destructive.

Nickel.—A metal, silver white, tenacious, malleable, ductile, magnetic, similar to iron, but not easily rusted (oxidized), will *weld*, can be plated upon other metals as silver is, therefore very useful. Generally found in certain ores of copper, iron, and arsenic. Principal supply from New Caledonia. Found also in many parts of Europe and in Pennsylvania. Uses: German silver, an alloy of nickel, copper, and zinc; nickel coins, five cent and three cent, are three-fourths copper and one-fourth nickel; nickel cent only one-eighth nickel; nickel plating, by battery and otherwise—bright surface is pure nickel. (From articles *Coin* and *Nickel* in Appletons' Amer. Cycl.). *Objects*, three cent, five cent, and one cent nickels; pieces of nickel, plated ware; German silver. Ore.

Clay.—Qualities: plastic (when moist), tough, tenacious—absorbent when dry - colors of—peculiar smell and taste. Found in many places and in most countries. Many kinds according to purity. Formed from granite and other rocks by the pulverizing action of frost and water. Fine particles of feldspar and quartz—settled down from water. *Ordinary* clay is *brick* clay—red color of bricks and flower-pots from iron

rust in clay—Milwaukee bricks are straw colored, no iron. If lime is in the clay a brick easily melts. Other kinds and uses. *Fire* clay for fire bricks; *potter's* clay for common crockery; *fuller's earth* for dressing cloth; Kaolin or *porcelain* clay, mostly pure feldspar. Clay contains the *rust* or *oxide* of an exceedingly valuable and useful metal called *aluminium*, white, brilliant, tougher, and stronger than steel, but much lighter; can be welded, soldered, and plated; makes valuable alloys. *Miscellaneous.*—Most New York bricks from Hudson River clay beds. Tiles, earthenware, stoneware—alum obtained from clay—aluminium from alum—clay used in clarifying sugar; adobe houses. Most important use—most valuable part of fertile soils. Antiquity, variety, and importance of ceramic art. (From articles *Clay and Pottery*, Dana's Mineralogy, and in Appletons' Amer. Cycl.) Objects—lump of clay, pieces of various kinds of bricks, tiles, pottery, etc.

GRAMMAR.

Grammar is the *science of the sentence;* therefore, the fundamental idea to be imparted is, *what constitutes a sentence.* This information must be imparted by means of oral lessons. Ideas involved in *definitions* should be developed before the pupils are required to commit such definitions to memory.

Let a short sentence be written on the slate or blackboard, and then let the pupils be made familiar with the relations of the words used as *subject*, *verb* or *predicate*, and *adjuncts.* The distinctions comprehended in the *parts of speech* can all be successively taught in this way, and the pupil be enabled readily to point them out before he is required to say what a noun or pronoun, or verb, and so forth, is. The learning of the definitions will be easily accomplished as he proceeds. Thus, when the teacher presents the sentence, "Industrious pupils learn very rapidly," the pupil is made to discover, first, the principal parts—*subject* and *verb*, or *simple predicate;* next, that *industrious* is

added to *pupils*, *rapidly* to *learn*, and *very* to *rapidly*. The pupil then knows that *industrious* being an adjunct of a noun is an adjective; that *rapidly* being an adjunct of a verb, is an adverb, and that *very* being an adjunct of an adverb is also an adverb. This instruction can be supplemented by requiring the pupils to construct sentences of a similar kind; as sentences containing a simple subject and predicate—sentences containing a subject and adjuncts with a simple predicate—sentences containing a subject and predicate, with adjuncts of both.

The sentences presented should at first be carefully classified, so that no difficulties may be presented which are beyond the pupils' ability or actual attainments to solve. In grammar especially should the instruction be systematic and logical.

The sentences required to be studied in this grade include:

1. Sentences with a simple subject and a simple predicate; 2. Those with simple word adjuncts of either subject or predicate or both; 3. Those with simple phrase adjuncts (so as to teach the *preposition*).

Of course, the study of grammar as prescribed in this grade does not supersede the "exercises for correction," required in all the grades. These exercises, however, by degrees lose their *empirical* character and become scientific.

Outline.

Teach *subject*, *predicate*, *object*, *noun*, *verb*, *adjective*, *adrerb*, *pronoun*, *preposition*, and *conjunction;* the distinction between *transitive* and *intransitive* verbs; case and number (best exemplified in the *pronoun*). Make the sentence the basis of instruction. As a simple preliminary step in the important matter of the arrangement of words in a sentence, direct attention to the order in which the principal parts usually appear; namely, 1, subject; 2, predicate; 3, object. The simple sentence, as a rule, does not admit the comma.

ARITHMETIC.

Written and Mental.—Suggestions as in preceding grades, and also the following:

MENTAL.—1. For the purpose of review, brief examples in fractions, both common and decimal, should be employed, so as to test, and more thoroughly fix in the pupil's mind a knowledge of the principles and applications of fractions as taught in the preceding grades. The improvement made by the pupils in accuracy and rapidity, as well as in the ready application of arithmetical principles to particular cases involving an exercise of the judgment and reasoning powers, should be progressive from grade to grade, and should be carefully tested in the mental work.

2. The *special* province of this grade being *Denominate Numbers*, the exercises, both mental and written, should deal largely with the applications of fractions to that class of numbers, including Federal money, and should, of course, combine practice in all the essential tables of weight, measure, etc.

3. The review of the analyses previously taught should be systematic and thorough, but should not consume a large part of the time of the pupils.

WRITTEN.—1. The arithmetic specially prescribed in this grade is of a practical character, perhaps more generally so than in any of the other grades of the course. All that precedes has been, to a considerable extent, a preparation for the work of this grade, and will be found involved in it. In view of the great importance of the subject, and in order to render the requirements as definite as possible, the syllabus given below presents, first, certain

preliminary considerations; and, second, specific directions as to the extent of the field comprehended in the grade.

2. The whole subject of compound denominate numbers is strictly *utilitarian*. Practical utility should, therefore, be the controlling element in all the exercises employed. The daily necessities of the house, the shop, the market, etc., indicate the general character of the selections to be made. These will furnish at least as good mental discipline in calculation and analysis as those of a less severely practical character.

3. The average time which pupils in this grade can yet spend in school is short. Secure, therefore, the essentials first. Review and test thoroughly the indispensable basis —the tables. (See Grades 8 and 7.) Train your pupils to work with reasonable rapidity. Carefully avoid long and complex examples. Avoid all things obsolete or obsolescent. Keep a clear record of the points you have covered; it will assist in the reviews and in the examinations. Do not dwell so long on Reduction as to omit important practical points in other rules. With the tables commence Reduction. See that the tables are not only memorized but understood; many of the tables have already been reviewed and applied to the reduction of integral denominate numbers in the Fifth Grade.

SYLLABUS.

Fractional Denominate Numbers.—Reject all examples in addition, subtraction, multiplication, and division of fractional denominate numbers. In reduction *there are but two cases*, and the second of these is simply the converse of the first. Each divides into two varieties, in one of which the fraction is common and in the other decimal, but the principle applied in working is the same.

Be careful to select only those denominate numbers in which such fractional quantities are likely to need consideration, chiefly sterling money.

Examples: Case 1st. { A. $\frac{3}{7}\frac{3}{7}$ of a bushel to pecks, quarts, etc. B. .673 of a £, how many shillings, pence, etc., or dollars and cents ?

" Case 2d. { A. 7 cu. ft. 95 cu. in., what common fraction of a cubic yard ? B. 15 cwt. 38 lbs. are what decimal fraction of a ton ? £8 14s. 9½d. are how many dollars and cents (at $4.87) ?

Addition and Subtraction of Denominate Numbers.—Subtraction best taught in connection with *addition.*

Multiplication of Denominate Numbers.

Division of Denominate Numbers.—Note the distinction between the different cases.

NOTE.—Suggestions for the application of these four rules, and of reduction of integral denominate numbers, will be found below, in connection with the "Weights and Measures."

Weights.—Teach briefly, by examples, the relations of Avoirdupois and Troy weights, the essential identity of Troy and Apothecaries' weights. Let most of the examples in Reduction be in the first of the three. They should be few and very short in the last.

Remember that the quarter of a hundred weight and the avoirdupois dram are seldom used now excepting in text-books.

In addition and subtraction give avoirdupois weight. Remember that in things sold by the ton the ounce is not taken into account.

Linear Measure.—Reduction.—Employ the denominations most in use—inch, foot, yard, rod, and mile. Give a few examples to show the use of the chain and its subdivisions.

Omit addition, subtraction, multiplication, and division.

Surface Measure.—(Of very great practical importance.)—Treat briefly in reduction. Be particular to avoid long examples. When 30¼ is used as a divisor let it be in very short examples. Give examples in addition and subtraction. Give examples in finding areas of rectangular figures. Give the feet, or the chains, in the sides of rectangles, to find acres and value ; acres and hundredths the most usual form. Simple questions, involving cost, may occasionally be given in plastering, paving, carpeting, dress linings, etc., etc.

Solid Measure.—Employ only the inch, the foot, the yard, and the cord ; use the last but little. See that pupils understand the mutual relations of linear, surface, and solid measures, and that these measures are not convertible. Reduction—a few simple questions. Omit addition and subtraction. Give examples in finding cubic inches, feet, or

yards, in boxes, bins, cellars, cylindrical cisterns, etc.; also contents in bushels and gallons.

Dry and Liquid Measures.—Use no obsolete denominations. Omit beer measure. Remember that the barrel and the hogshead are not often measures in commerce. Simple examples in reduction, multiplication, and division.

Circular Measure.—Treat briefly; explain the terms and their use; omit signs. Reduction—Short examples of two or three terms. Addition and Subtraction—Questions in difference of latitude and longitude. Geographical and statute miles on the meridian, on the equator, on parallels of 60°.

Time.—(In part very important.) Treat reductions very briefly. Do not involve more than two or three denominations in one example. Addition and subtraction. Difference of dates by days, and by years, months, and days.

Miscellaneous.—Practical examples in values, involving dozen, gross, quire, ream, quintal, barrels of flour, fish, etc., making out simple bills, receipts, etc.

Money.—Give but few examples in each rule in sterling money. Reduction of sterling to Federal, and *vice versa*, omitting, of course, all reference to the percentage of exchange.

Pupils should know something of the money of Canada, identical with our own; the value of the franc and of the German mark.

GEOGRAPHY.

United States reviewed.—See Fifth Grade.

North America in Detail.—Follow general directions for Fifth Grade in greater detail.

Asia and Africa.—The outline of these grand divisions will include their boundaries; area and population in round numbers; simplest physical divisions; names and relative positions of their several countries; brief statements of general facts relating to the climates and productions of the countries; the names and location of their capitals, and of the more important islands, mountains, seas, gulfs, rivers, lakes, etc.

In Africa, only the Barbary States, Egypt, and Cape Colony, should be made at all prominent.

HISTORY OF THE UNITED STATES.

SUGGESTIONS.—Note carefully the general suggestions of preceding grade.

The work of this grade is, "Outline with Greater Detail." The following Syllabus of Topics is indicative of the amount of information the pupils may properly be expected to possess at the conclusion of this grade.

SYLLABUS OF TOPICS.

1. *Discoveries.*—Columbus, 1492—first voyage only—(refer in general way to his subsequent voyages)—The naming of America—Spanish claims—The Cabots—English claims—Discovery and occupation of the St. Lawrence—French claims.

2. *Virginia.*—Settlement of Jamestown, 1607 (omit unessential details)—Tobacco—Slavery—Refer briefly to Indian wars, but omit all details—Refer briefly to other colonies once wholly or partly within the limits of Virginia.

3. *New England.*—Puritans in England—"Pilgrims"—Settlement of Plymouth, 1620—Salem—Boston—Refer very briefly to other colonies wholly or partly settled from these three—also to Indian wars.

4. *New Netherlands.*—Henry Hudson, 1609—Fort Orange—Manhattan—Stuyvesant—English conquest—Refer briefly to extent of New Netherlands and to other colonies afterward cut off.

5. *New York.*—Changes in name, 1664—Refer briefly to reconquest by the Dutch, and subsequent restoration to the English.

6. *French and Indian War.*—1753—Causes—a few leading events—results—It trains and prepares the colonists to become soldiers of the Revolution.

7. *Revolution.*—1775—Chief causes—Declaration of Independence, July 4, 1776—a few other principal events—results—Refer briefly to Articles of Confederation, and to the adoption of the

8. *Constitution.*—First President, 1789—events—Jefferson and Louisiana—its extent.

9. Madison and War of 1812—Its causes and results (briefly).

10. Mexican War—1846—Its causes and results.

11. Civil War—1861—Chief causes and general results (treat briefly and carefully avoid making or allowing partisan statements).

Be careful so to lay out the work to be done, that it may readily be completed before promotion.

THIRD GRADE.

Outline Course.

1. Language Lessons.—*Reading* of the grade of an easy Fifth Reader —at least one lesson per week in supplementary reading: *oral lessons* on the simple facts of natural philosophy: *compositions* as before: *spelling*, *meaning*, and *use* of words, as before: exercises in the formation of *derivative words: English grammar* (without text-book) continued.

2. Arithmetic.—*Written* and *Mental*—Through percentage, including such rules as do not involve consideration of time, with their applications. Problems to be chiefly such as involve the ordinary business transactions.

3. Geography.—South America and Europe in detail.

4. History of the United States.—To the Revolution.

5. Penmanship.—Writing in copy-books, with practice in different styles; short paragraphs to be written from dictation; instruction in letter-writing.

6. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw one historic vase, not less than six inches high, without perspective effect, decorated. One original pottery form, without perspective effect, decorated with any leaf, flower, form, or historic ornament, used in previous grades. Two examples of bi-symmetrical historic ornament of different styles, greatest dimension not less than six inches. Two original examples of surface covering, using not less than two different units for the repetition. One original circular border. An example of design for textile fabric.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for READING, found on page 20; those for SPELLING, on page 29; those for the MEANINGS AND USES OF WORDS, on page 31; and those for COMPOSITION, on page 28, are to be taken as belonging to this grade also.

ORAL LESSONS.

NATURAL PHILOSOPHY.

1. As a means of appropriate mental discipline, no other department of the Oral Lessons prescribed for the several Grammar School grades is of equal importance with these lessons on simple facts of natural philosophy. It is needless here to dwell upon the practical and permanent value of a knowledge of these facts. It will not be inappropriate, however, for the teacher to impress upon the pupils the general relations of this knowledge to the marvels of modern progress, and to direct their reading for more extended information.

2. In the work assigned to this and to the next higher grade, nothing beyond a simple *introduction* to and *preparation* for scientific study is attempted.

3. Only a small part of the vast field can be covered,

yet whatever is done, should be done with system. To this end, a carefully prepared note-book—not *text*-book—is indispensable for the teacher. See page 25.

4. Begin every lesson with an experiment, or, if necessary, with several experiments. The *oral* work in the teaching will consist chiefly in careful questioning upon the phenomena as observed by the pupils. *Tell* when you *must;* but tell as little as the nature of the special topic, and a proper economy of time will allow.

5. It is of especial importance that the pupils should be in every way encouraged to find instances of the applications of the principles they have been taught: these *they* can themselves discover in the phenomena and incidents of their daily life, at home, in the street, the shop, and the school. Thus they will be led to form habits of observation and reflection.

6. The teacher will find a wide difference in the readiness with which pupils will conceive and apply scientific principles. With a few, the bare statement of a principle will often enable them to point out its simpler applications. The results of a certain order of experiments, and the simpler deductions from them, will be promptly anticipated by such minds. But it will not be so with all: only after careful and repeated illustration will the principles which interpret the facts represented be clearly apprehended by some. In all experiments the pupils themselves should be made, as far as possible, participants. In reviews they should be called upon to repeat the experiments or statements that have been made, and to give the proper explanation. They should be encouraged to try further experiments for themselves at home, and then to furnish an account or repetition of them in the class-room, if possible. The teacher will also particularly remember

that it is not necessary to follow slavishly the exact order or selection of topics given in the subjoined syllabus. For instance, the consideration of the mechanical powers may precede that of the properties of matter, or of the attractive and repellent forces.

7. When the scientific meaning of a common term differs greatly from the popular one, great care should be taken to point out clearly such difference, in order that the pupil may not be misled by thinking that he knows that of which he is really ignorant. Among the many cases in which this will be found necessary, the terms *porosity*, *porous*, *solid*, and *impenetrability* may be taken as instances. It is by no means necessary that the pupil should be able to give an exact and comprehensive scientific *definition* of such terms; a few analytical questions by the teacher will readily show whether the subject is understood.

8. As far as the subject will allow, the pupil should be led through the medium of *experiment* to a knowledge of the *facts*. The facts once ascertained, the *principles* underlying them may be deduced. A limit will, sooner or later, be reached, where parts of the subject, so far as they may be entered upon, *must be taught empirically*, in consequence of the pupil's limited knowledge of other departments of science.

For instance, suppose that the teacher has already experimentally established in his pupil's mind a general idea of the terms *force* and *gravity*, and that he now wishes to lead him to know that "the *weight* of a body is the *measure* of the *force* of *gravity*" acting upon it, and after that to establish the *law of its variation*. Let the teacher or one of the pupils borrow a common spring scale—the smaller and simpler the better; let a pupil *pull*, and at

the same time notice that he is exerting a *force;* that the position of the index will vary with the *degree* or *amount* of force; that the *motion* is in the *direction* of the force, however the instrument may be held: now place a succession of heavy bodies in the scale, and let him notice that the *effects* are identical with those produced by his muscular force. He will no longer *vaguely* conceive that the effect produced upon the scale is because the body is *heavy* (which was to him a vague term), but because the *earth* actually *pulls* it as he did, though no connecting bond is visible, as when *he* pulled. A knitting-needle suspended and balanced upon a thread, and acted upon by a simple magnet, will clearly convince him that a *force* may be exerted by one body upon another without actual contact. You have clearly defined for him the idea that "the weight of a body is the measure of the earth's attraction upon it." If now you wish to teach the law of the *variation of the weight* of a body of invariable mass, as should indeed be done, the next step must be *empirical.* The pupil's deficiency in mathematics forbids any other course of procedure. The "Law of Gravitation" must be *stated* to him, together with the reason for stating without proof. It will develop in many a mind an earnest desire to supply that deficiency. The law of the *variation* of weight may now be readily *deduced* by first adding to the pupil's mathematical knowledge the technical meaning of the term *square*, and then giving a variety of simple arithmetical problems to illustrate it.

9. There is, perhaps, no graver or more common error in relation to this subject, among earnest teachers who are called upon to teach it, than the notion that this requires expensive or complicated apparatus. The very contrary is indeed the case in the great majority of instances. Ex-

pensive apparatus, with its show of brass and glass, has a direct tendency to repress the most precious element and evidence of a teacher's success—experimenting at home by the pupils themselves. The principles of the *lever* may be just as well developed by means of a pen-handle, a pointer, or a window-pole, as by a polished brass or steel bar; a large spool makes an excellent *wheel and axle;* a ribbon-block, a good single pulley, fixed or movable; a slate, a book, or a shingle, an *inclined plane;* a pocket-knife will soon furnish a good *wedge* from a little piece of board, while the use of the blade itself is an excellent illustration of the application of the principle; and a large screw or a discarded auger-bit, with a knitting-needle or a pen-holder for a lever, makes an efficient *single screw.* And so through every department of the subject. Nothing marks more fully the ability of a teacher than fertility in such resources. Strings, tops, balls, and marbles; pop-guns, potato-mills, bean-shooters, and putty-blowers, and the thousand and one nameless articles to be found in pupils' pockets furnish an exhaustless mine of apparatus, and good apparatus too, for the skilful teacher. The immortal Dalton wrought out his atomic chemical theory with apparatus which may be excelled in many a junk or old-bottle shop, and the teacher determined to succeed will find that "where there is a will there is a way."

SYLLABUS OF TOPICS.

(To be illustrated, as far as possible, objectively.)

Properties of Matter.—Body or mass, molecule, atom; solid, fluid, liquid, gas; sensible or cellular pores, as in bread or sponge; physical or intermolecular pores, as in iron, water, air, etc.; porosity. Extension, impenetrability, rarity and density, compressibility and expansibility, inertia, mobility, molecular attraction and repulsion. Indestructibility of matter briefly explained. Cohesive force; properties dependent

upon cohesion; tenacity, flexibility; brittleness, hardness, ductility, malleability. Properties dependent upon cohesive attraction and molecular repulsion; elasticity; elasticity of flexure, of compression, of expansion, of torsion. Relations of the forms of matter, as solids, liquids, and gases, to molecular attraction and repulsion. Adhesive force; properties dependent upon it; capillary attraction and its important uses in organic and inorganic nature. Divisibility of matter: into particles by mechanical force; into molecules by heat, solution, etc.; what forces are overcome in each case, and by what force.

Gravity.—Why called universal gravitation: its simplest phenomena; why bodies fall: mutual attraction of floating substances; law of gravitation; weight a measure of gravity. Centre of gravity; line of direction; plumb-line; stable, unstable, and indifferent equilibrium. Motion: simple and compound; circular motion; centripetal and centrifugal force.

Mechanical Powers.—Lever, with simple problems in mental arithmetic; pulley, wheel and axle, inclined plane, wedge, screw.

REFERENCE BOOKS.—The usual text-books on physics; numerous articles in Appletons' and other cyclopædias; Faraday on Physical Forces; Tyndall's Matter and Forces.

COMPOSITION.

1. Letter-writing is specially prescribed as an exercise in the Third, Second, and First Grades. From the dating of the letter to the final direction upon the envelope, great care should be taken to insist, as in all other written exercises, upon neatness and legibility. A habit of scribbling is easily formed but is very hard to break.

2. In these three grades a special exercise preliminary to writing out the composition should occasionally be given, in which, a suitable subject being announced, the pupils should be required to write, without assistance, a brief synoptical outline of the points and items to be included in the composition, and then to number or arrange them in some logical order, so that, when expanded into a composition, a proper consecutiveness will be observed.

The form already advised for the teacher's note-book of subjects taught orally will be found simple and efficient for this purpose. Some such plan is indispensable to the best work, and to the development of that self-help and self-reliance which every element of school training should tend to establish as a permanent habit of the mind.

FORMATION OF DERIVATIVE WORDS.

The exercises prescribed for the First, Second, and Third Grades naturally include those prescribed for the lower grades; their further extension to the formation of derivative words being understood to include wider and more difficult groups, such as those given below. The uses of these words in illustrative sentences will, of course, form the best test that the instruction given has been practical and efficient. The formal study of English etymology from Latin and Greek roots is not prescribed for any grade.

Sense: Nonsense, sensation, sensational, senseless, senselessly, sensory, sensitive, sensitively, sensitiveness, sensible, sensibly, insensible, sensibility, sensual, sensually, sensuous, sensuality, etc.

Scribe: Inscribe, etc., *describe*, etc., *circumscribe*, etc., *prescribe*, etc., *proscribe*, etc., *subscribe*, etc., *ascribe*, etc. *Script: Description*, etc., *scripture*, etc., *conscript*, etc., *prescription*, etc.

GRAMMAR.

The sentences, still simple, should be of a more difficult character than in the previous grade.

The exercises in construction should be made to corre-

spond with the character of the grammatical work of the grade; and the pupils in their compositions should, as far as possible, exemplify the grammatical instruction given. Sentences which occur in these compositions should always constitute a portion of the subject-matter of the grammar lesson for the day. In the character of the sentences selected for this purpose, the good judgment of the teacher will be displayed.

Etymological exercises should be interspersed, especially in the use of the *apostrophe* as a sign of the possessive case —in the proper plural termination of nouns—the proper forms of the pronouns, etc. This is a point of considerable importance.

The exercises for the special purpose of accustoming the pupils to care and criticism in the use of language, should be continued.

Outline.

All the parts of speech; declension of nouns and pronouns; comparison of adjectives and adverbs.

Introduce the attribute. Teach all the uses of the phrase. Make the sentence the basis of instruction. Omit *gender* of nouns; make little or no reference to *person* of nouns. With the exception of the possessive, the cases of nouns are of little practical importance. The *case* of a pronoun is a matter of inflection.

Refer to the normal order, (1) Subject, (2) Predicate, (3) Object or Attribute. By the simplest illustrations direct attention to the changes in the sense that changes in this order bring about. For example, "Great is Diana of the Ephesians!" (Emphatic); "Is John at home?" (Interrogative); "Go ye and teach" (Imperative), etc. Teach the general rule that qualifying words and phrases should be placed as near as possible to what they qualify. Examples: "I only spoke a few words," should be, "I spoke only a few words;" "I saw the city, sailing up the river," for "Sailing up the river, I saw the city." Phrases, when they do not closely follow the words on which they depend, are generally set off by the comma.

ARITHMETIC.

The teacher is enjoined to bear in mind that, in teaching business arithmetic, it is especially important to insist upon clearness, neatness, legibility, accuracy in results, and reasonable rapidity. Mental exercises, corresponding to the written, should form a large part of the work of this grade.

1. The commercial arithmetic of this grade differs from that taught in the preceding grades, chiefly in the introduction of the various forms of Percentage.

2. The divisions of this subject should be presented in the following order: First, *Simple Percentage*, in four cases—one fundamental and three derived; second, the *applications* of Simple Percentage, technically known as *Profit and Loss*, *Commission*, *Brokerage*, *Insurance*, *Taxes*, etc., following the same order and with the same analysis as in the four cases of Simple Percentage.

3. In treating this subject many skilful teachers prefer to introduce algebraic formulæ, in which the initial letters of the several terms employed in Percentage are the elements. To this course there is no objection, *provided* that the formulæ be not employed in the mental arithmetic, and that they accompany the usual *analysis* and be not used as a *substitute* for it.

4. The subject of arithmetic being necessarily and to a great extent cumulative, the teacher of the Third Grade is especially advised to read over the directions given in all the preceding grades, and in particular the table on page 76. For the sake of brevity, the terms *Base*, *Percentage*, etc., are employed in the following Syllabus of Topics, in the usual technical sense of the text-books.

The teacher will so use them or not, as the Principal may deem expedient.

SYLLABUS OF TOPICS.

The term *percentage*—Reading per cent.

Examples—Read the following decimal fractions as per cent. : .75, .8, .605, .003, .08½, .00¼, etc.

Change common fractions to per cent., and *vice versa:*

Examples—¾, $\frac{7}{8}$, $\frac{450}{900}$, $\frac{83}{83}$, 2¼, 1$\frac{2}{11}$, $\frac{13}{17}$, etc.

25 per cent., 75 per cent., 33⅓ per cent., 14$\frac{2}{7}$ per cent., 88$\frac{8}{9}$ per cent., 325 per cent., 137½ per cent., etc.

NOTE.—The common business fractions—halves, thirds, etc., to twelfths, inclusive—should be reduced to per cent., and the pupils be made thoroughly familiar with them.

FIRST CASE (*Fundamental*).

To find the *percentage* when the *base* and *rate* are given.

See table, page 76.—To find a given fractional part of a given number.

Examples—How much is 9 per cent. of 750 ? Had $750 in the bank ; drew out 9 per cent. : how much was it ?

Analysis as in the multiplication of decimal fractions.

NOTE.—When this form of the case has been taught, its modifications should immediately follow.

Examples—Had $750; paid out 9 per cent. How much had I left ?

Had $750 ; earned 9 per cent. more. How much had I then ?

SECOND CASE (*Derived*).

To find the *rate* when the *percentage* and *base* are given.

See table, page 76.—To find what fraction one number is of another number.

Examples—140 is what per cent. of 400 ?

Had 400 sheep; sold 140. What per cent. did I sell ?

Analysis as in reducing a common fraction to a decimal fraction whose denominator is hundredths.

Modifications of Case Second :

Examples—I had 400 sheep; I now have 540. What is the per cent. of increase ?

I had 400 sheep; I now have only 260. What is the per cent. of decrease? or what per cent. have I left?

Third Case (*Derived*).

To find the *base* when the *percentage* and *rate* are given.

See table, page 76.—To find the number of which another number is a given fraction.

Examples—140 is 35 per cent. of what number?

Sold 140 sheep, which was 35 per cent. of my flock. How many had I at first?

Analysis as in simple fractions—140 is $\frac{35}{100}$ of what number?

Modifications of Case Third:

Examples—Sold 140 sheep, which was 35 per cent. of my flock. How many had I left?

Sold 140 sheep, and have 65 per cent. of my flock remaining. How many had I at first?

Fourth Case (*Derived*).

To find the *base* when the *amount*—or the *difference*—and *rate* are given.

To find a number which differs by a given fractional part of itself from a given number.

Examples—What number is by 8 per cent. of itself more than 351? or 351 is 8 per cent. more than what number?

My flock of sheep increased 8 per cent.; I then had 351. How many had I at first?

I lost 8 per cent. of my sheep, and had 299 remaining. How many had I at first?

Analysis. { First, find the per cent. represented by the given number, thus: 100 per cent. − 8 per cent = 92 per cent.
Second, proceed as in Third Case: 299 is $\frac{92}{100}$ of what number?

As a part of the general review, give an example in the fundamental case, and let the pupils derive the other three cases from it.

Commission and Brokerage, and *Profit and Loss* are but applications of Simple Percentage. Each presents itself under all the four cases, but requires no special additional teaching, except in regard to the technical terms employed.

GEOGRAPHY.

South America in detail.—The continent, as a whole; its boundaries; the names and boundaries of its political divisions; a few of the chief capes and islands; the position and direction of the great plateaux and mountain ranges; five or six of the most famous volcanoes. In the drainage, only two or three lakes, the courses of the Orinoco, the Amazon, the San Francisco, and the Parana described; their great branches named and pointed out as systems, but not described.

The local geography of the countries taken separately will include a review of the matter previously considered in the study of the continent—that is, the boundaries, the positions of the mountains and plateaux, the principal rivers, etc., together with the capitals of the several countries, and about thirty other principal seaports and interior cities of the continent.

Teach the descriptive geography of the continent as a whole. That of the several countries may thence be very easily deduced. It should include the surface of the country, as mountain, plateau, or plain; the zones; the climate as modified by latitude, elevation, and the prevalent winds; the leading characteristics of the great plains and plateaux; a brief notice of volcanoes and earthquakes; principal plants and animals; the three races, their distribution and principal occupations; the European languages; the chief productions and exports; and the forms of government.

Europe in detail.—The general plan to be pursued has been sufficiently indicated in the suggestions made with reference to other grand divisions. The greater our in-

tercourse with any country, the greater is the necessity for our study of its geography in more minute detail.

Our intimate relations with the various countries and peoples of Europe, in race, language, religion, literature, and commerce, and the prominence of its affairs in the newspapers read by every class of the community, give great importance to the careful and intelligent teaching of its geography.

When classes are studying or reviewing the geography of the several countries of this continent, these various relations should receive brief but definite attention; and, when considering the prominent industries and exports of each, our imports from that country and exports to it should be briefly noticed.

HISTORY OF THE UNITED STATES.

Suggestions.—The teacher is particularly referred to the General Suggestions on United States History in the preceding grades.

The work of the Third Grade is comprised in the following:

SYLLABUS OF TOPICS.

Voyage of Columbus—the naming of America—the occupation by the Spaniards of the West India Islands and all the neighboring portions of the continent—their enslavement of the Indians and its results (the last very briefly).

The discovery, exploration, and occupation of the St. Lawrence and Nova Scotia by the French.

Virginia.—The settlement of Jamestown and the events directly leading to it. The cultivation of tobacco—the introduction of slavery—the navigation acts and Bacon's rebellion.

Maryland.—The Calverts—religious freedom—Clayborne.

New England.—The Plymouth Company and the settlements under their patent. The Puritans—their previous history—why called Pilgrims. Settlement of Plymouth—of Boston—of Dover—Massachusetts Bay Colony. Settlement of Connecticut—of Rhode Island—provisions for religious freedom. The Union—Indian Wars (read) —Andros—King William's War, its causes and results—Salem witchcraft (read)—Queen Anne's War, its causes and results—King George's War, its causes and results.

New Netherlands.—Hudson—settlement on the Delaware—at Fort Orange—at Manhattan Island—the Dutch Governors—Kieft's conduct —Stuyvesant—existing evidences of the Dutch occupation.

New York.—Changes of name—reconquest by the Dutch and restoration to England. Andros—the extent of his rule. Dongan—Leisler—Schenectady—the Negro plot—existing evidences of English rule.

New Jersey.—Its name—its division—union with New York—separation.

Delaware.—Settlement by Swedes—conquest by Stuyvesant.

Pennsylvania.—William Penn—his grant—his objects. Settlement of Philadelphia—relations to Delaware.

North Carolina.—The grant of Charles II.—its limits—John Locke.

South Carolina.—Charleston settled—Carolina divided into two separate governments.

Georgia.—Savannah settled—character of Oglethorpe.

General condition of the English colonies in 1752. Their population —their national derivation—their industries, social condition, planters, patroons, proprietors—the causes which were developing a love of liberty.

Review *chronologically* under the heads of sovereigns of England—Elizabeth—James I.—Charles I.—Cromwell—Charles II.—James II.—William and Mary—Anne—George I.—George II.

Review *biographically*—Columbus, Bacon, Williams, Penn, etc.

The French and Indian War.—This should be taught in outline, the principal points being: The gradual extension of the English and French settlements, leading to conflicting claims—the explorations and posts of the French in the valleys of the Mississippi, the St. Lawrence, and the Lakes—Marquette and La Salle—the debatable land on the upper Ohio—relatively small population of Canada—the building of Fort du Quesne, 1754—Colonial Congress at Albany, 1754—Braddock's and Johnson's expeditions, and their results, 1755—Monckton's expedition, 1755—cruel expulsion of the Acadians—capture of Oswego, 1756—Fort William Henry, 1757—siege and capture of Louisburg, 1758—repulse

at Ticonderoga, 1758—concentration of French forces at Quebec, by abandoning nearly all other posts—battle of Quebec, 1759, and results —Treaty of Paris, 1763—its conditions.

In teaching the French and Indian War, let the ten dates marked be studied by the *years* only. *Read*, but do not *memorize*, the *details* of military movements and events—fix the *sequence* of events—use the map.

In the review, let the pupil tell very briefly of Washington, Braddock, Johnson, Monckton, Amherst, Abercrombie, Howe, Wolfe, Dieskau, and Montcalm.

SECOND GRADE.

Outline Course.

1. Language Lessons.—*Reading* of the grade of a Fifth Reader—supplementary reading continued: *oral lessons* on the simple facts relating to air, water, light, heat, and sound: *compositions* as before: *spelling*, *meaning*, and *use* of words, as before: exercises in the formation of *derivative words*, continued: *English grammar*—the construction of compound and complex sentences, with the view of teaching propriety of expression.

2. Arithmetic—*written* and *mental*.—Interest, simple and compound, including partial payments; discount, bank and true; proportion, simple and compound.

3. Geography.—The review of Europe; Asia, Africa, and Oceanica in detail.

4. History of the United States.—Completed.

5. Penmanship.—Writing in copy-books; also of paragraphs and business forms, such as bills, receipts, and drafts; letter-writing continued.

6. Drawing.—On paper, illustrated on blackboard, from dictation and from chart.

Draw one natural lobed leaf and flower—conventionalize them and with them draw two designs for industrial purposes. Draw from the model or round the following: cube, square prism, cone, cylinder, and square pyramid. Draw (*free hand*) concentric squares, hexagon, octagon, circle, concentric circles, ellipse, oval.

Perspective Drawing (*permissible*).—Draw in linear perspective, from drawings made on blackboard only, the following: picture plane, horizon, points of sight, points of distance, points at different distances within the picture plane; horizontal and vertical lines of different lengths and distances, within the picture plane; vertical and horizontal squares, cubes, square prism, and square pyramid in parallel perspective; in angular perspective, horizontal cubes and square pyramids.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for READING found on page 20; those for

SPELLING on page 29; those for the

MEANING AND USE OF WORDS on page 31; those for the

FORMATION OF DERIVATIVE WORDS on page 104; and those for

COMPOSITION on page 28, are to be taken as belonging to this grade also.

ORAL LESSONS.

WATER, AIR, ETC.

For general suggestions, see page 98.

SYLLABUS OF TOPICS.

(To be illustrated, as far as possible, objectively.)

Water.—Mobility of liquids—its cause; their small compressibility; pressure in every direction; gravity the primary cause; how downward pressure is converted into side and upward pressures. Equality of pressure at a given point; variation with the depth; the term *level;* why water has a level surface; why the hydrant water flows from the open tap; at what height it ceases to flow, and why; other illustrations of the same principle; what that principle is; the hydrostatic paradox; the hydraulic press; specific gravity; floating bodies; why iron ships float; the quantity of water displaced by any floating body.

Air.—Its mobility, compressibility, expansibility, and elasticity; chief mechanical difference from liquids; its weight; its pressure in

all directions; how shown; the common lift-pump; the mercurial barometer; its construction; principle and uses; Torricelli's experiment; Pascal's experiment; the aneroid barometer; height of atmosphere and gradual diminution of its density.

Sound.—Preliminary. A general idea of the transmission of vibrations, illustrated. The nature of sound, its objective and subjective elements. Sonorous bodies highly elastic. A medium necessary. The air as a medium. Other media. Limits of audibility of vibrations. Velocity in air and other media. Loudness does not alter the velocity. Reflection of sound. Echo, its causes and limits. Physical distinction between mere noise and a musical sound. Pitch in music. Influence of sound-boards. Tuning-forks, speaking-trumpets, speaking-tubes. Resonance—murmur of shell. The ear, its construction and action—the wonderful physical condition of the tympanum when listening to a full orchestra. Trace the successive transmissions of vibrations from a street organ to the brain, through closed windows.

NOTE.—Many important experimental illustrations may be given by the aid of a simple tuning-fork.

Heat.—Known only by its effects. Effect on the nerves—effect upon the constitution of bodies. Transmission of heat—three ways illustrated—air a bad conductor and worse radiator—important relation of this to clothing, to vegetation, etc. Heat as a sensation—relation of terms hot and cold. Sources of heat—quantity and effects of solar heat—its relations to physical geography. Source of the heat developed by friction—motion of mass converted into molecular motion. Heat only a mode of vibratory motion. Force as indestructible as matter. Source of heat in combustion. The common thermometer—principles employed in its construction—zero, what it is and how obtained. Evaporation—its causes—effects on temperature of bodies. Phenomena of boiling—temperature of boiling water—why invariable at a given elevation—economic applications—why the boiling-point varies with elevation—boiling in a closed vessel. The steam-engine—its essential elements and general principles—high-pressure and low-pressure engines.

Light.—Moves in straight lines. Shadows. Sources of light. Vibratory nature of light (only refer to it). Velocity of light—how known. Law of intensity illustrated. Photometry by shadows. Non-luminous bodies—how seen. Reflection—its law—mirrors, and their uses (treat more fully of the plane mirror than of the others). Refraction—its simplest phenomena—its law. Lenses—uses of, especially the convex lens. Color—the prism and the solar spectrum—the order of

the colors, and their dependence upon wave-length (refer very briefly to thermic and actinic rays). Phenomena of the rainbow—the colors of objects—primary colors. The eye and vision.

Reference Books.—The ordinary manuals on Natural Philosophy; articles in Appletons' and other cyclopædias; Tyndall's Forms of Water; Tyndall's Heat as a Mode of Motion; Tyndall on Sound; Tyndall on Light; Youman's Correlation and Conservation of Forces; Rood's Modern Chromatics; Le Conte on Light; Lommel on the Nature of Light; Cooke's New Chemistry (introductory chapters); Buckley's Fairy Land of Science (articles, The Aërial Ocean in which we Live, The Voices of Nature).

GRAMMAR.

In this grade the pupil should learn the construction and use of complex and compound sentences. The general structure of such sentences, and the relation of their clauses and members should be clearly seen by the pupil. Such insight is essential to a correct and definite understanding of the meaning of what we read and hear, as well as to facility and variety of expression. All subtle and practically useless distinctions must be avoided. What follows will illustrate the requirements and instruction in this grade:

"Pay the debts which thou owest; for he who gave thee credit relied upon thy honor, and to withhold from him his due is both mean and unjust."

This sentence consists of two members: (1) "Pay the debts," etc., to "owest;" (2) "He who gave thee," etc., to "unjust." These members are connected by "for."

The first member contains the clause "which thou owest," used as an adjunct of "debts."

The second member consists of two clauses: "He who gave thee," etc., to "honor," and "To withhold," etc., to "unjust."

The structure of the sentences constructed by the pupil should be made the subject of criticism, with reference to their *clearness* in expressing the meaning intended to be conveyed—their *propriety*, *unity*, etc. The thought itself may be, to some extent, subjected to critical remark.

Exercises in the correction of false syntax should be abundantly used in this grade. The construction of sentences should assume the character of extended composition, the themes being selected by the pupils themselves, or assigned by the teacher. Of course, care should be taken that the themes are of a simple character, appropriate to the youthful mind, and calculated to awaken thought, not to repress it, as is too often the case, when subjects of an abstract or comprehensive character are chosen for the exercise.

OUTLINE.

Compound and complex sentences; mood and tense; declension and comparison reviewed; exercises in changing simple sentences to complex, complex to simple, etc. Teach the general rule, that qualifying clauses should be placed as near as possible to what they qualify: for example, "The book that belongs to me is lying upon the table," not "The book is lying upon the table that belongs to me." Show that each sentence should have only one principal subject of thought. Show that the agreement of the verb with its subject is true only so far as the verb has inflection: that in the imperative mood, for instance, the rule of agreement in person and number does not apply. The clauses of compound and of complex sentences are generally separated by a comma.

ARITHMETIC.

1. In this grade, the teaching consists in large part of a review of what has gone before, with exercises sufficient in number and difficulty to familiarize the pupils with the principles, and render them expert and accurate in their

application. For suggestions in regard to this part of the work, the teacher is referred to the preceding grades.

2. The advanced work comprises the following: *Interest—Simple and Compound*—including *Partial Payments, Bank Discount and True Discount; Simple and Compound Proportion.* The exercises employed to teach these departments of arithmetic should be of as practical a character as possible; and all the processes should be specially analyzed, the rules given being in all cases deduced from this analysis. A knowledge of the *business transactions* involved and of the terms employed in any of the rules or their applications, should always be imparted to the pupils before they are required to solve the problems. Failure more frequently arises from a want of this knowledge than from a deficiency in arithmetical attainment.

3. The following *syllabus* contains a brief summary of what is suggested to be taught in this grade:

INTEREST.—Teach the definitions of the terms—the distinction of simple from compound interest—the legal rate of United States and of the State of New York.

In classes of an average character, *one* good method will be found to give better results than *two or more.* Whatever method be employed, the pupils should, from the first, be carefully guarded against considering and calling the multiplier a concrete number.

If the six per cent. method be employed, it should be carefully analyzed, and the pupil should not be allowed to sacrifice sense to conciseness by such statements as "the half of 7 months is 3 cents and a half"—"one-sixth of 24 days is 3 mills," etc. As a preliminary to applying this method, the class should have a thorough training on such questions as the following: In 2 years, 3 months, and 20 days, at 6 per cent. per annum, *what decimal fraction of the principal* is equal to the interest? At 7 per cent.? at 5? at 8? at $7\frac{1}{2}$? etc.

NOTE.—In finding *interest*, at *any given rate*, by the six per cent. method, the interest on the *principal* should first be found at six per

cent., and afterward increased or decreased, as may be required; by so doing, difficult fractional multipliers will be avoided.

Give examples involving the various forms of the difference of dates. Example: Find the interest of $340 from January 5th to July 2d, at 6 per cent.

Examples involving the method, when the year is estimated to consist of 365 days, should also be given. This is one of the most important of the business methods.

Example.—Find the exact interest of $340 from December 1, 1883, to January 27, 1884, at 4½ per cent.

Give examples in Bank Discount; also in True Discount, distinguishing carefully its differences in principle and method from *bank* and from *commercial* discount.

NOTE.—(On the derived cases of simple interest.)—In teaching the four derived cases of simple interest, begin with an easy example in the fundamental case, and from that derive the others in their order, being particularly careful to teach that, being derived, they all require division; that, to find the *rate*, the given interest is to be divided by the interest at 1 *per cent.*; to find the *time*, by the interest for 1 *year*; to find the *principal*, by the interest of a *principal of* $1; and that, in the fifth case, the given *amount* is to be divided by the *amount of* $1.

Partial Payments and *Compound Interest* should be very briefly treated, and with very simple examples.

The form and nature of a promissory note, and the meaning of the several terms applicable to it, and the forms of bills and receipts, are included in the work of this grade.

PROPORTION.—Ratio; proportion defined; relation of antecedents and consequents; ratio of 4 to 12, 4 : 12, $= \frac{4}{12}$; method of finding the missing term; simple and compound proportion distinguished; problems involving each (these problems should be only such as are required to illustrate the principle, since they are ordinarily to be solved by analysis previously given).

GEOGRAPHY.

Europe reviewed.—See Third Grade.

Asia, Africa, and Oceanica in detail.—For the plan to be pursued, see preceding grades.

Complete the local and descriptive geography of one

continent, or grand division, before beginning that of another.

As in the preceding grades, it is of great importance that the entire field covered by the grade be completed and reviewed before the promotion of the class to the next grade.

HISTORY OF THE UNITED STATES.

For general suggestions, see preceding grades.

SYLLABUS.

Review, and teach as follows:

The Outlines of the Revolutionary War.—(Teach as in the French and Indian War.)

Causes of the Revolution.—Navigation Acts—restriction of colonial manufactures—effects of war on the national debt of England—taxation without representation—the Stamp Act, 1765—its nature—causes which led to its repeal—the Tea Tax—riot in Boston, 1770—the Boston "Tea Party"—its immediate causes, and its consequences—Nature of the Port Bill, 1774—first Congress at Philadelphia, its measures—*Lexington, April* 19, 1775—its effects upon the country—Bunker Hill—siege of Boston—Washington appointed Commander-in-Chief—evacuation of Boston, and subsequent general drift of military events toward the West and South—*Declaration of Independence, July* 4, 1776—battle of Long Island—its purposes and results—retreat to the Delaware—capture of the Hessians at Trenton—Princeton—La Fayette—British move on Philadelphia, 1777—Chad's Ford—its consequences—Burgoyne's invasion, its route and purpose, 1777—Schuyler—Burgoyne's disasters—Gates—the two battles of Stillwater—Clinton's movements—*Burgoyne's Surrender, October*, 1777—its far-reaching consequences—the French alliance and assistance—British retreat from Philadelphia—battle of Monmouth, 1778—New York the base of the British—destruction along the coasts of Connecticut and Virginia—Wyoming—battle of the Chemung, 1779—it breaks forever the power of the Iroquois—Paul Jones—Charleston captured, 1780—Large numbers of Tories in the South—consequent years of guerilla warfare—Sumter—Marion—Gates at Camden—destruction of his army, and of Sumter's force—Arnold's treason—the mutiny at Morristown, 1781—

its causes—condition of the Army—Robert Morris—Arnold's ravages—Greene's retreat—battles in Carolina and their consequences—Cornwallis at Yorktown—combination of the French and American forces—*Surrender of Cornwallis, October*, 1781—its effects in America and England—Treaty of Paris, 1783—its terms—condition of the country.

Articles of Confederation, 1776, 1777, 1781—the Government before 1781—after 1781—Shays' rebellion, 1786—leads to a convention to revise the Articles—a new *Constitution* devised instead, 1787—adopted by the States—*goes into operation*, 1789—ordinance of 1787.

1789-1797—*Washington's Administration.*—*Domestic* History.—Cabinet—leading measures—States admitted—their former relations.

1797-1801—*Adams' Administration.*—*Foreign* relations.—Continued troubles with France. *Domestic* History.—Unpopular measures—the death of Washington—removal of the Capital.

1801-1809—*Jefferson's Administration.*—*Domestic* History.—Admission of Ohio—its previous relations. The Louisiana purchase, its immediate and subsequent importance. Hamilton and Burr, 1804—a sketch of the history of each. Fulton's first steamboat, 1807. *Foreign* relations.—Tripolitan war, 1801-1805, its causes and results. (*Read* the detail, if given.)

The state of Europe, and the importance of our carrying trade. Extraordinary measures of France and England in relation to the rights of neutrals. English claims of right of search and impressment—bearing of the impressment claim upon our naturalized citizens, and our national honor. "Once a subject, always a subject." Affair of the Leopard and Chesapeake, 1807. Orders in Council and the Milan Decree, 1807. Embargo, 1807-1809. Non-intercourse Act, 1809.

1809-1817—*Madison's Administration.*—The entire interest centres in the *Foreign* relations—they control the *Domestic* history. Berlin Decree abolished, 1810. (*Read* the affair of the Little Belt—Indian war.)

War declared June 19, 1812—its two chief causes.

NOTE.—*Read* the detail of the military and naval operations; show briefly in outline, first, the aggressive expeditions into Canada, from Detroit to the St. Lawrence; their general failure; second the smallness of the navy—its brilliant success, but little direct influence on the fortunes of the war, excepting on the Lakes—utter destruction of American commerce; third, the aggressive expeditions of the British, the Americans being chiefly on the defensive after 1812. Indian war in the West and Southwest. Invasions from Canada. Blockade of all important ports. Naval and military expedition against Washington and Baltimore. Invasion by the way of Lake Champlain. Expedition

against New Orleans, and its purposes—final repulse of all these attempts, and similar fate of renewed aggressions of the Americans against Canada. Destruction of the Indian power.

Give the sequence of leading events, omitting the dates, excepting as to years.

The Hartford Convention—its alleged purposes—its effects. Treaty of Peace, December, 1814. A part of the general pacification of Europe upon the fall of Napoleon. The causes of the war not even alluded to in the treaty. Have these questions ever been settled? If so, when and how?

NOTE.—Read the second Barbary war, 1812–1815—its causes and results.

1817–1825—*Monroe's Administration.—Domestic* History.—Missouri Compromise, 1820—formation of new parties on questions of commerce and finance. Whigs and Democrats. The leading questions until 1845. *Foreign* relations.—Purchase of Florida. The Monroe Doctrine, 1822, its origin and importance.

1825–1829—*John Quincy Adams' Administration.*—Tariff of 1828, and its consequences.

1829–1837—*Jackson's Administration.—Domestic* History.—United States Bank. Nullification, 1832. Clay's Compromise.

1837–1841—*Van Buren's Administration.*—Panic of 1837. Sub-Treasury Bill, 1840. Political revolution.

1841–1845—*Harrison and Tyler's Administration.—Domestic* History.—Bankrupt Law. Dorr's Rebellion. *Foreign* relations.—The Maine boundary. Annexation of Texas.

1845–1849—*Polk's Administration.—Domestic* relations now give direction to *Foreign* policy. Oregon boundary. Chain of causes leading to the Mexican war. Boundary claimed by Texas. Mexican war, May, 1846, to February, 1848.

NOTE.—*Read* the details; give the leading military events in sequence, omitting all dates excepting years. Teach with the following grouping: Northern operations—Taylor east of the Rio Grande—west of it. Wool—Kearney—Doniphan—Fremont. Southern operations: Scott's campaign.

Treaty of Guadaloupe Hidalgo—its terms. Discovery of California gold in 1848—its important subsequent influence upon the national development.

1849–1853—*Taylor and Fillmore's Administration.*—Slavery question the leading element in subsequent history. California question, 1850—its alleged relation to the Missouri Compromise. Death of Taylor Clay's Compromise Bill, 1850.

1853–1857—*Pierce's Administration.*—Effects of the Fugitive Slave Bill. Kansas-Nebraska Bill, 1854—it abrogates the Missouri Compromise. Rise of a new party, "Free soil" or Republican. Civil war in Kansas, its causes; flow of immigrants into the Territory.

1857–1861—*Buchanan's Administration.*—Kansas troubles. John Brown's affair—its effects. Split of the great Democratic party. Four Presidential candidates. Election of Lincoln. Extreme doctrine of State Rights. Secession of South Carolina, December, 1860. Fort Sumter. More States secede. Confederate Government formed, February, 1861.

1861–1865—*Lincoln's Administration.*—Civil War. Fort Sumter, April 12, 1861. Effects upon the North. President's proclamation. More States secede, making eleven in all.

NOTE.—*Read* the details of the war; show the importance of foreign intervention, and the efforts on both sides in regard to it.

In the review show that the operations of the Confederates were mainly defensive, except in the great sorties of Lee at Antietam and Gettysburg, of Hood at Nashville, and of Early at Chambersburg—all of which were repelled. That the main objects of the aggressive movements of the Union troops were, 1st, the destruction of Lee's army; 2d, the opening of the Mississippi. That after the opening of that river by the fall of Forts Henry and Donelson, and the subsequent capture of New Orleans and Vicksburg, the lines were contracted by a movement from the northwest to the southeast, ending in Sherman's march from Atlanta to Savannah and Goldsboro'. The leading incidents will then readily fall into place. Show the importance of the blockade, the chief function of the fleet; also, but very briefly, the enormous expenditure of men and money on both sides, and the measures by which they were obtained.

1865–1869—*Johnson's Administration.*—Death of Lincoln. The two subjects of leading importance—1st, providing for the public debt; 2d, reconstruction. The Thirteenth Amendment. The President and Congress quarrel. Impeachment. The French in Mexico and the demand of the United States Government. Purchase of Alaska. Laying of the Atlantic cable.

1869–1877—*Grant's Administration.*—Pacific Railway. Fourteenth and Fifteenth Amendments. Alabama question. Leading provisions of the Treaty of Washington. The Geneva arbitration.

1877–1881—*Hayes' Administration.*—Dispute about election of Tilden.

1881—*Garfield's Administration.*—Death of Garfield. Successor, Vice-President Chester A. Arthur.

FIRST GRADE.

Outline Course.

1. Language Lessons.—*Reading, spelling, meaning*, and *use* of *words*, continued; supplementary reading as before; *English Grammar*, continued; *composition*, continued; a review of the previous grades in the *formation of words*.

2. Arithmetic.— *Written and mental:* a review of the business arithmetic of the preceding grades; also, *exchange, equation of payments, averaging accounts, custom-house business, partnership*, and *mensuration*.

3. Geography.—A general review.

4. History of the United States.—A general review, and the principal features of the Federal, State, and Municipal Governments.

5. Penmanship.—Exercises in copy-books, and in writing selected paragraphs from dictation; business forms; letter-writing, continued.

6. Drawing.—On paper, from illustration on blackboard only. Draw from the round (*free hand*), hexagonal and octagonal prisms. Groups of the following models: cube, cone, cylinder, plinths, pyramid, antique vase. Original designs for industrial purposes.

The oval, ellipse, hexagon, octagon, pentagon, concentric circles, concentric squares, spiral, equilateral triangle, and trefoil.

Two examples of bi-symmetrical historic ornament.

Perspective Drawing (*permissible*).—Draw in parallel perspective the cube, square prism, pyramid, hexagonal prism, the circle, cone, and cylinder.

Draw in angular perspective the cube, square prism, and pyramid.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

The general instructions and suggestions for
READING, found on page 20; those for
SPELLING, on page 29; those for the
MEANING AND USES OF WORDS, on page 31; and those for
COMPOSITION, on page 28, are to be taken as belonging to this Grade.

GRAMMAR.

1. Sentences of an irregular or idiomatic construction should be presented to the pupil, with the view to show how far they can be made to harmonize with the ordinary methods of construction, and to teach the just limits of their use.

2. The exercises in grammar should embrace the careful and critical study of select passages from some of the best English and American writers; as Shakspeare, Milton, Pope, Cowper, Young, Bryant, Longfellow, etc. Prose writers, such as Addison, Johnson, etc., should also be drawn upon for exercises, always, however, with a critical end in view, to discover and correct errors, as well as to find excellences and beauties.

3. Such exercises, to however limited an extent it is possible to carry them, will always exert an important in-

fluence upon the pupils' style of composition, if not of daily speech. They will serve, moreover, to cultivate the taste of the pupils, and to awaken an interest in their minds in the study of English and American literature. A good reading-book will be found an important auxiliary in carrying on the instruction here suggested.

OUTLINE.

Idiomatic expressions and sentences of irregular construction; simple, complex, and compound sentences continued; conjugations; paraphrases exercising the pupils in the interchange of words and their equivalent phrases, and of phrases and their equivalent clauses. General review.

ARITHMETIC.

Every *topic* to be treated in this grade should be introduced by *mental exercises*, the slate being used only when the numbers involved are too large to be readily retained in the mind without being written. The pupils should be constantly practised in this mental work. The *text-book* in mental arithmetic should be sparingly used, if used at all; and great care should be exercised in assigning lessons for home-study in this branch.

SYLLABUS OF TOPICS.

1. EXCHANGE.—Its nature; bills of exchange; par of exchange; acceptance; domestic exchange—to include two cases. 1. To find the cost of a draft when its face and the rate are given. 2. To find the face, the cost and rate being given; foreign exchange, including the consideration of bills on England, France, and Germany (cases as in domestic exchange); analysis as in percentage.

2. EQUATION OF PAYMENTS.—Cases: 1. To find average time of payment, when the items have the *same date*, but different credits. 2. When the items have different dates. 3. To find the average time for paying balance of account, having both debits and credits. Analysis, on the principle of *interest;* reduction of each principal involved to $1 preferable.

3. CUSTOM-HOUSE BUSINESS.—Meaning and practical applications of the following terms: Customs, Custom-house, Port of Entry, Collector of Port, Tariff, Duties—Specific and Ad Valorem, Invoice, Tare, Tret, or Draft, Gross, Net, etc.

4. STOCKS AND BONDS.

5. PARTNERSHIP.—Terms defined. Cases: 1. To find each partner's share when the profit or loss is divided according to capital only, including simple cases of *general average*. 2. To find it when time is considered. Analysis, fractional, or by means of proportion.

6. MENSURATION.—Include at least the following cases: 1. To find the area of a parallelogram when the base and altitude are given. 2. To find the area of quadrilaterals, with sufficient data. 3. To find the area of triangles. 4. To find the area of a circle. 5. To find the diameter or circumference of a circle. 6. To find the solid contents of a cube, parallelopiped, prism, pyramid, cylinder, cone, and sphere. 7. To find the contents of a cask or other vessel.

GEOGRAPHY.

General Review.—This review should include and generalize so much of the simple facts of the Physical Geography already taught in the preceding grades as will enable the pupil to understand and illustrate the great principle of geography as a science, namely, that the resources and development of a country depend intimately upon its situation, latitude, elevation, winds, rain-fall, temperature, soil, minerals, waterways, and the general character of its surface. The review of Industrial and Commercial Geography, with which the preceding should be blended, should include a brief outline of the leading agricultural, mineral, and manufactured products, and the chief exports of the various countries of the world, their principal ports, and especially those that have an important trade with the United States. The review of Political Geography should comprise a brief *résumé* of the names and location of the capitals and large cities of the several countries, and their forms of government.

HISTORY OF THE UNITED STATES.

For general suggestions and syllabus of topics, see preceding grades. The general review should be in all the three forms described on page 81.

It should also include a brief but definite outline statement of the rapid development of the country since 1815, and of the leading elements in that development. Emigration and Immigration. Erie Canal and the Great Lakes as the great waterway. Steam—steamboats—railways—telegraphs. In the review include a notice of prominent men, such as Calhoun, Clay, Webster, Seward, Greeley, Fulton, Morse, etc.

The study of the History of the United States is to include a very brief consideration of the principal features of the Federal, State, and Municipal Governments, but not as a separate study. Only the leading features are to be taught, and most of these as incidental to the current study or review of the lessons in history. For instance, the preamble of the Constitution is intimately connected with certain historic events, and the real significance both of the events and of the preamble can be perceived only by studying them in combination. *First*, the *adoption* of the Constitution—see 1787–89; *Second*, the term "*people*"—not *peoples*; *Third*, States already "united"—see 1860; *Fourth*, "more perfect union"—see Articles of Confederation and the imperfect union then existing; *Fifth*, "insure domestic tranquillity"—see Shay's Rebellion, the dangerous boundary disputes of New York, New Hampshire, Vermont, and other States, etc. Again, the impeachment of Burr, or of Johnson, the succession of Tyler and other Vice-Presidents to the presidency, etc., will give

proper occasion to consider the functions of these officers and of the Supreme Court. The Whiskey Rebellion and the Nullification dispute will give significance to the phrase "power to lay and collect taxes, duties, excise," etc.; 1812 and 1846 will illustrate "power to declare war"—and so on with scores of points of interest and importance to every intelligent citizen. A brief and convenient syllabus is subjoined.

SYLLABUS OF TOPICS.

Constitution.—Meaning of the term; supreme law; when, why, how, and by whom established; how amended.

Branches of Government.—General function of each; what and who are citizens; some of their most important rights; rights of accused persons; fugitives from justice. Census; when and why taken.

Congress.—Branches; principal powers of Congress; powers denied; on holding other offices; time and place of meeting.

Senate.—Number of Senators; qualifications; by whom chosen; they represent the States as States; term; chief special powers and duties; presiding officer.

House of Representatives.—Number from each State; qualifications; by whom chosen; direct representatives of the "people"—not of a State, but of the United States. Principal special powers and duties; presiding officer.

Laws.—The several stages by which a "bill" becomes a law.

Executive.—President and Vice-President; qualifications; how chosen; chief powers and duties; veto.

Judiciary (very briefly).—Courts; judges; how appointed; general duties; impeachment.

State Governments.—Officials; Legislature; branches; law-making power; where meet; municipal government; cities; officials; their powers and duties.

Important Terms and Phrases.—Trial by jury; *habeas corpus* act; *ex post facto* law; treason; attainder; quorum; elector; presidential elector.

PENMANSHIP.

Penmanship is prescribed to be taught in each grade of the Grammar School Course: in addition to this constant practice is also required in *slate-writing*. By means of the latter much can be accomplished in insuring to the pupil readiness and fluency in the exercise of penmanship.

The exercises in written spelling, composition, etc., should be performed with accuracy, even if some sacrifice of rapidity be at first required. Of course, there should be a constant effort to improve both in rapidity and accuracy—*quantity* as well as *quality* being made a criterion of merit and success.

The slate-writing should, as far as it is practicable, exemplify the principles and methods formally taught in the lessons in penmanship. Pupils should not be permitted to violate in one class of exercises the rules and precepts taught and practised in another. This is especially applicable to the holding of the *pencil*, which should be sufficiently long to be held as a *pen*.

The lessons on *penmanship* should be methodical and progressive, whatever system may be employed. In the lower grades the exercises should be rudimentary, but the pupil should not be retained in them too long. He should be permitted to *write* as much as possible: making *strokes* and *curves* is not *writing*, although it may be valuable as leading to it.

The use of *trial papers* should not be carried to the extreme of withholding the pupil for a considerable time from the use of his copy-book. The pupil should be taught the necessity of doing everything as well as he can do it; but perfection in details should not be expected in

the rudimental stages. It should, *from the first*, be deemed essential (at least *meritorious*) to execute the prescribed work with despatch, provided there is no want of care or attention.

A proper distinction should be made between the lessons given to show the pupils how to write and the exercises designed to practise them on what they have thus learned. In the former, the whole class should invariably be occupied in the same work, the teacher explaining, and illustrating from the blackboard, the principles and methods which form the subject of the lesson: in the latter, practice being the object in view, it is not so essential that all the pupils should be doing the same thing at the same time, although even here it is a convenience to the teacher, since it facilitates supervision.

It should be carefully kept in view that the *hand* and the *eye* as well as the *mind* of the pupil are to be trained in this branch of instruction—the *hand* to execute, the *eye* to discern, the *mind* to judge. These are not to be educated separately and successively, but simultaneously.

A correct method of holding the pen, a proper position of the body while sitting at the writing-desk, and a suitable placing of the book or paper, are highly conducive to the acquisition of a good handwriting. Every lesson should, for some time, be introduced by distinct directions as to the proper method of holding the pen, and these the pupils should not be permitted to violate. With regard to the position of body and position of book, a few simple directions will be all that are requisite. The teacher should see that the pupils sit in such a position as to allow perfect freedom of motion of the right hand and arm, ease of respiration, and as much physical ease otherwise as the seat and desk will permit.

The books should, if possible, be provided with covers and blotters; the pens should be carefully cleaned at the end of each lesson, and should be changed as often as necessary; and the ink should be kept in the best condition. Each page of the book should end with the name of the pupil and with the date.

In the higher grades—the *first* at least—the writing of copies consisting each of a single line, should be discontinued; and paragraphs, verses, business forms, notes, superscriptions, etc., should take their place. The exercises in book-keeping should be made subservient to the instruction in penmanship, writing up the usual blank-books being made, to some extent at least, a substitute for the use of copy-books. Various styles of writing should be taught, as far as time and opportunity may permit—as the business style, epistolatory style, engrossing style, etc. This has reference to the Female as well as the Male Grammar Schools.

DRAWING.

Instructions and Suggestions.

The course in drawing for the primary classes has been designed to familiarize the pupils with the use of the pencil in drawing (free hand) straight and simple curved lines in different positions; to teach them to draw lines of given lengths, and to divide lines into equal parts; to cause them to make applications of this elementary work in drawing various plane figures; and to give them some idea of symmetry as shown by simple arrangements of straight and curved lines in plane figures. With this preparation the pupils of the Grammar Grades should be able,

without any great difficulty, to accomplish the work laid down for them. In what follows, work of the same character, extending through several grades, is considered under one general head, and not in detail in the separate grades: notes are also made under each grade when found necessary.

Lead Pencils.—A very soft pencil should not be used for sketching, as it interferes with the neatness of the drawing: a hard pencil should not be used for strengthening lines, as it makes depressions in the paper. If but one pencil be used, let it be of a medium grade.

In sketching the pencil should be held lightly, at least an inch from the point; in strengthening a line the pencil may be held nearer the point. Use the point of the lead for fine lines, the side of the lead for stronger ones.

Erasers.—In general the eraser is necessary, but it should be used as seldom as possible. To impress upon pupils the necessity of carefulness, have them draw a figure occasionally without the eraser.

Mechanical Aids.—Mechanical aids, such as rulers, measures, and compasses, may be used with advantage in the following cases: a plane figure which is to inclose a symmetrical arrangement or a design; construction lines of such arrangement or design; lines that contain a border or that separate its units.

The construction lines of vases and of conventionalized leaves and flowers are sufficiently simple to be made without mechanical aids.

Blackboards.—In each grade the blackboard should be used by the teacher to illustrate the *method* of drawing the figure or of forming the design under consideration: the slate or paper may be used by the pupils to follow rapidly the successive steps of the teacher.

While it is preferable that the teacher's blackboard sketching should be neat and accurate, it is not essential for this point of the instruction: it is essential, however, that drawings which are to be *copied*, whether from chart or blackboard, should be as accurate as it is possible to make them.

Plane Figures.—All the plane figures are sufficiently simple to be drawn without mechanical aids.

Symmetry.—In forming a bi-symmetrical figure the principal axis should be drawn first, the transverse auxiliaries next, and then the outline. If the principal axis be vertical the left-hand portion of the figure should be drawn first; if horizontal, the upper portion first. These suggestions are often applicable in drawing vases and conventionalized leaves.

Borders.—In drawing horizontal borders it will be well, after the construction lines have been made, to complete the left-hand unit before beginning the next: in drawing vertical borders begin at the top.

Leaves and Flowers.—Encourage pupils to gather leaves and flowers appropriate to the grade, and teach them to conventionalize them: by this means the pupils will be led to seek originality in design, a most important point in the instruction in drawing.

Vases.—As it is almost impossible to have a sufficient variety of vases in any school, ask the children to note carefully the forms of such as they may see elsewhere. Have them sketch these rapidly, as they may remember them: from these sketches make selections for general class-work. By preserving the best forms thus gathered, each teacher may, in the course of a few terms, become possessed of a great variety.

Original Designs.—In designs for wall-paper, etc., in

which a unit is to be repeated, the first unit should be drawn with great accuracy; the remaining units may be "transferred:" few repetitions of the unit need be made.

Drawing from the Model.—In teaching drawing from the model it is necessary that instruction first be given on such essential points as the following: the apparent convergence of receding parallel lines; the representation of a circle, viewed obliquely, by an ellipse; tangential lines in a drawing of a cone. After this preliminary instruction, the model should be so placed that each pupil will have a good view of its characteristic features: each pupil should then draw it on paper *as he sees it.* The drawing of the object as it actually appears to each pupil—not the copying of what may appear to some one pupil in a particular position—is the work designed for the Second and First Grades.

Home Work.—Home work may be given to pupils in the First and Second Grades.

Seventh Grade.—In the example of *surface covering* it may be found desirable to arrange the design by actual measurements: the lines, however, should be drawn free-hand.

Sixth Grade.—It will be well to show the pupils how to make ellipses by means of their foci: afterward teach them to draw, with the aid of the axes, the ellipses specified for this grade.

The two views of the conventional leaf and flower may be a front and a side view.

Fifth Grade.—The method of constructing the pentagon may be taught the pupils first by mechanical aids: afterward the same principles of construction should be applied in drawing it free-hand.

Fourth Grade.—Three convolutions of the spiral will be sufficient.

Third Grade.—In the circular border the ornamentation should not be so minute as to cause many repetitions of a unit.

COURSE OF INSTRUCTION IN VOCAL MUSIC.

Eighth Grade.—Songs and exercises in key of C. Whole, half, and quarter notes and rests. Dotted halves and quarters. Double, triple, and quadruple time. Expression marks *p*, *f*, *mf*. Common chord in three positions.

Seventh Grade.—Songs and exercises in key of C. Scale extended upward to F, downward to G. Sixteenth notes and rests. Dotted eighths. Expression marks *ff* and *pp*. Common chord in three positions. Common intervals. Formation of major scale. Tetrachords. Notes of common chord in accord.

Sixth Grade.—Songs and exercises in key of C continued. Formation of G scale and comparison with that of C. Easy exercises and songs in key of G. Common chord of each key in three positions. Sextuple time.

Fifth Grade.—Two-part singing in keys of C, G, and F. Use of sign <>.

Fourth Grade.—Two-part singing in keys of C, G, F and D.

Third Grade.—Two-part singing in keys of C, G, F, D and A.

Second Grade.—Two-part singing in keys of C, G, D, A, F, B flat and E flat. Triads.

First Grade.—Three-part singing. Major and minor thirds. Chord of the seventh. Minor keys.

Rules Relating to the Posture of the Body and the Position of the Mouth.

The singer should stand upright, letting the body rest upon both feet, the heels just touching each other. Throwing the weight upon one foot is to be avoided, because it forces the body into a curved and inelegant position, and causes tones produced to be wanting in precision. The arms should neither be fixed rigidly by the side nor be folded across the chest.

The head should be held easily erect.

The shoulders should be thrown back, the chest inflated, and the abdomen somewhat drawn in so as to allow the lungs fully to expand.

The mouth should be opened wide enough to admit the passage of the thumb in its breadth between the front teeth. The jaws should be held one exactly above the other, and the tongue be allowed to lie flat in the mouth, before any attempt to sing is made. This position of the organs in question should be assumed, lest the nasal sound of *n* become audible; and it must not be altered during the continuance of a tone, for by every such change the tone is modified.

Beware especially of any distortion of the countenance.

The Breathing.

The management of the breath in singing is of the greatest importance; for upon the manner and regularity of the singer's breathing depend the formation of the tone and the successful rendering of the musical phrases and of the text.

The breathing should be done inaudibly. The pupil

should be especially instructed in the art of producing prolonged tones at as little expense of breath as possible; at first with soft tones, with loud tones afterward.

Breath may be taken at any point where the meaning of the text and the connection of the melody will not be interrupted; therefore, after pauses or punctuation marks; at the completion of a musical group; before long notes; before the last or after the first beat of a measure; or, in other words, after the accented beats. The latter direction is given, because at such points a better conclusion of the melody is possible. It is a rule of the first importance that breath be not taken at a bar; that is, after an unaccented beat. An exception to this rule is made only when the rhythmic structure of the melody, or the punctuation, demands it.

The time that is needed for breathing never is to be taken from the tone *before*, but from the tone *after* which breath is drawn. For instance, if the tone after which one breathes is represented by a quarter note, it is sung as an eighth note, the other half of its value in time being used for breathing.

As the singer should always have a good supply of breath on hand, prudence demands that he should not only use his breath economically, but that he always should take breath wherever, according to the foregoing rules, he is permitted to do so; for if he do not, he may be forced to breathe when the rules forbid it. Neglect of this wise precaution is apt to force the singer to "press" the tone, whereby it receives a languid, thin, uneasy coloring.

After one long, full breath has been taken, it is well that the subsequent breathings be short or medium in length; otherwise the lungs may become fatigued. It is,

perhaps, needless to add that the physical constitution and the age of the singer must always be taken into consideration.

Pronunciation.

The pronunciation of the words of the text must be clear and correct. A distinct enunciation is of great importance in singing; for upon a clear utterance of the vowel sounds depends the beauty of the tones, and upon a distinct pronunciation of the consonants depends the hearer's understanding of the words of the text.

Musical accent or rhythm is simple or compound. Double time and triple time are forms of simple rhythm, in each of which the first beat is accented. Double time gives origin to quadruple time; triple time to sextuple, 9-8, and 12-8 time.

Expression depends upon the choice of the right tempo and pitch, the proper degree of loudness, and upon correct declamation.

In singing, beware of dragging and shouting. The initial tone must be given precisely, even in piano passages. The sliding of the voice in search of the right tone is not to be tolerated. The singing must pour forth as from a single mouth.

Gloomy weather causes the spirit to flag, and makes every exertion a burden; the judicious teacher will take this into consideration in determining the possibilities regarding correctness.

PERMISSIBLE SUBJECTS.

Elements of plane geometry, algebra, perspective drawing, book-keeping, and outlines of astronomy are permissible subjects. Any or all of these subjects may be taught in any school if permitted by the Committee on Course of Study upon application by the Board of Trustees.

ALGEBRA.

1. This subject is to be taught as a peculiar *mathematical language*, by means of which the relations of quantities and the results of their combinations may be expressed, and reasoning in regard to them may be facilitated. The symbols of *quantity*, *relation*, and *operation*, should at first be carefully taught and illustrated.

2. The *simple operations* of addition, subtraction, multiplication, and division, should not be exhaustively treated, as is usually done, before the pupil is made acquainted with the nature and use of equations. The *equation* is to Algebra what the *proposition* is to ordinary language. It is the means of definitely expressing a mathematical truth, either particular or general. *Inequations* (technically so called) express truths, but not exactly. When we say $x + y > 75$, we do not indicate *how much* the sum of x and y exceeds 75; but when we say $x+y = 6$, we express a precise fact. It is suggested, therefore, that *equations* be presented very soon after the preliminary explanation of the symbols employed. The examples of equations first presented should be of the simplest character; and their use in the solution of problems should be *objectively* shown. This can be done by employing a few very easy questions; as, *What number is that, to the half of which if*

5 *be added the sum will be* 11? The pupil can be easily made to perceive the use of so expressing the condition that it can be kept clearly in view; as (x representing the unknown number) $\frac{x}{2} + 5 = 11$.

In solving such a problem, the successive steps or *processes of reasoning* should be kept in view. Thus, subtracting 5 from each member, the result (expressed by a second equation) is, $\frac{x}{2} = 6$; and, multiplying by 2, the result (expressed by a third equation) is $x = 12$, which gives the solution. (Applied axiom to be referred to.)

Such an exercise, properly performed, will develop more intelligence than will whole months of mechanically working out by blind rules, long sums in addition, subtraction, multiplication, and division. These exercises are proper in their place, but of themselves they have little, if any, educational or practical value.

Syllabus of Topics.

1. Preliminary explanation of symbols—*letters*, as representatives of quantity signs; signs of relation or operation, as, $+$, $-$, $\times$, $\div$, $=$, etc.; exercises to familiarize the pupil with their significance and the mode of reading them.

Note.—It will be of great service to accustom the pupil to read algebraic expressions in such a way as at once to indicate their meaning; as, $a + b$, the sum of a and b; $a - b$, the difference between a and b; $a \times b$, the product of a and b, etc. Exercises in finding the numerical value of expressions, when particular values are attributed to the representative letters, will greatly aid in accomplishing this result. Thus, find the value of $\frac{a^2b}{c} - b^3$, when $a = 3$, $b = 2$, $c = 1$, etc.

2. Easy problems in arithmetic, the solutions of which may be facilitated by the use of equations, the latter to be of the simplest form, and involving only an application of the pupils' acquired knowledge of symbols. This will at once show the pupils the value of the algebraic notation, and will interest them in the study of the subject, as being of practical value.

3. *Mental practice* in solving such problems, by means of equations. Most of the text-books in use will afford a sufficient variety.

4. Practice in solving equations of this character; each equation to be read previously in the form of a problem; as $\frac{x}{3} - \frac{x}{8} = 10$, which may be read: What number is that one-third of which exceeds one-eighth of it by 10?

The method of *clearing equations of fractions* and of *transposition* should be taught, not by applying mechanical rules, but as processes of analytical reasoning. Thus, in the equation above given, the pupil will easily be made to perceive, that the multiplication of both members by 24 will produce an equation without fractions.

5. After the pupils have acquired a clear idea of the nature and use of equations, and some expertness in operating with those of a simple character, those of a more difficult or complex form should be presented—giving occasion for the use of the operations of addition, subtraction, multiplication, and division, which can then be more exhaustively treated.

6. The nature of literal equations or *general expressions* should then be taught, and examples be given, some of which may be made to involve an application of all these processes. Such as the following are suggested:

(1.) $\frac{x+a}{b} - \frac{x-a}{c} = d$

(2.) $\frac{x-a}{b} + \frac{x-b}{a} = 2$

(3.) $\frac{x-a^2}{b} - \frac{x-b^2}{a} = o$

(4.) $\frac{x}{a-b} - \frac{x}{a+b} = 1$

(5.) $\frac{(a+b)x}{a-b} - \frac{(a-b)x}{a+b} = \frac{1}{4}$

Such equations as the above involve much useful practice, not only in adding, subtracting, multiplying, and dividing, but also in fractions and in factoring. The latter should receive careful attention.

6. The method of solving equations containing more than one unknown quantity—involving the various methods of *elimination*—should

follow this, and sufficient practice in the *solution of problems* should also be afforded. The latter, with the preparation herein indicated, may be made a most important aid in training the mind to careful and exact analysis, and logical reasoning—perhaps the most important object, generally, of the study of this subject.

NOTE.—This syllabus is not designed to be entirely exhaustive, but to afford hints as to the order and method of presenting the most important topics.

ELEMENTS OF PLANE-GEOMETRY.

The study of geometry, properly pursued, is of great advantage in several respects: it trains the pupil in habits of careful observations and of accurate expression; develops methods of close and critical reasoning, and furnishes the scholar with many principles essential to the study of mensuration, and of great practical value in the various departments of drawing.

In presenting this subject to the pupil the teacher should be very careful not to confine the attention to or dwell unduly upon any one of the purposes indicated above, but should, by variety of method, combine all the advantages to be gained from the study of geometry.

As the course in geometry is intended to be of a strictly elementary character, it is essential that there be made a careful selection of those propositions that are of a fundamental character, or of general practical application, and such selection should be the basis of the instruction. The proper selection having been made it will be found that, with accurately drawn figures, many of the propositions will be *discovered* by the pupils, and, after a little practice, will be accurately stated; the drawing should, as far as practicable, be done by the pupils themselves. Similarly, simple geometrical constructions can be made in accordance with the propositions thus discovered. Finally, some of the simpler demonstrations may be elicited.

To encourage the slower pupils, and to keep the body of the class from depending upon the few more precocious minds, it will at times be found advisable to have each scholar draw the figure upon a slate, and write whatever geometrical fact he may see: for instance, if isosceles triangles be drawn, many of the scholars will readily perceive the equality of certain angles. Similar practice may be given in constructions and demonstrations.

The selected propositions that have been found too difficult for consideration in the preliminary discussion of the subject may be taught with the aid of an elementary text-book. In using this it is essential that the theorem be carefully analyzed; the diagram be drawn in obedience to the conditions of the theorem—not in imitation of the figure in the text-book; and that the demonstration be a conclusion from things clearly seen and correctly stated by the pupil reciting—not a mere repetition of words, however well committed to memory.

BOOK-KEEPING.

1. After the forms required in single-entry book-keeping have been briefly taught, the nature of double-entry book-keeping should be explained, by showing the relation of *debit* and *credit*, by means of which one set of entries may be made to verify the accuracy of another.

2. The *classification* of accounts should be followed by an explanation of the three books—Day-Book, Journal, and Ledger. Journalizing simple entries in the Day-Book should then be taught; and sufficient exercises be given to impart readiness and accuracy in the process. Then by keeping a simple and brief set of accounts, the pupils will understand the whole theory and process, and will also become sufficiently expert in their application.

3. All the common *business forms* should be taught; as the form of bills, receipts, bank checks, promissory notes, bills of exchange, invoices, etc. *Business correspondence* should also receive attention; that pupils should become expert in writing a good business letter is of great importance. In every exercise fluency, legibility, and grace in penmanship should be carefully attended to. Both *quantity* and *quality* should be insisted on.

ASTRONOMY.

1. Astronomy, like the other permissible subjects, when selected and taken as one of the studies of a class, is to be examined and reported upon by the Principal, as in the case of studies regularly prescribed for all schools.

2. It is to be borne in mind that the chief purpose of this study in the Grammar Schools is, to teach the pupil to look intelligently upon the heavens; not with the minute and profound knowledge of the astronomer, but with such knowledge as is readily attainable even by the young mind, when its inspection of the common phenomena of the heavens is properly supervised and directed.

3. Nor should the teacher fail, in connection with this instruction, incidentally to impress upon the pupil, that, in studying the laws and facts of the universe, he is contemplating the works of a beneficent Creator, infinite in wisdom and power. No subject is so well qualified as astronomy to give just ideas in this respect, and, while performing a peculiar and most important office in the training and development of the intellectual powers, to exalt the understanding and give elevation and tone to the whole character.

4. A syllabus of leading points is subjoined. It will be

seen that nearly all of these may be readily taught without astronomical instruments or apparatus other than a globe and a blackboard. The highly interesting results of instrumental observation should be *read* in connection with the pupils' own observations, but no time should be spent in the endeavor to commit to memory the precise mathematical and other results. Just ideas of the magnitude of the heavenly bodies and of the interplanetary and interstellar spaces may readily be retained from *careful reading*.

5. As in the oral lessons of the lower grades, it is to be expressly understood that it is not expected that the whole of the subjoined syllabus will be taught, but that the Principal will make such selection of topics and parts of topics as he may think expedient. The only special conditions are, *first*, that as far as time and opportunity will allow, the pupils shall be led to observe for themselves the most simple and obvious phenomena of the heavens; and, *second*, that a record of topics considered be kept to show progress.

SYLLABUS.

The Heavens.—Apparent shape of (an illusion).—Things we see there—clouds, sun, moon, stars, comets, meteors, aurora. Horizon, the circular base of the visible heavens—where they seem to rest upon the earth. Apparent daily motion of the whole heavens—easily seen by different positions of stars and moon at early and late hours of a winter's evening. Notice the circular and oblique character of these motions. Some stars move very slowly and make very small circles—this easily leads to discovery of the nearly motionless Pole star; it never sets (to us). A very few conspicuous and neighboring constellations (Great Bear, Little Bear, Swan). How to recognize the Pole star. How to know which way *north* is. Show that the sun from its rising to its setting has similar motions. Highest daily point of sun—noon—meridian (through this point and *north* and *south*).

The Earth.—Shape, how known—ships, mountainous islands, shadow on moon in lunar eclipse (all these known to the learned among

the ancients). Size, motion around sun, a *year*, meaning of *orbit*. Motion on axis, known from apparent daily motions of stars, etc. What a *day* is. Inclination of axis to plane of orbit (indispensable for explaining the seasons), $23\frac{1}{2}°$. Tropics, polar circles, parallels, zones, latitude, longitude.

The Sun.—Varying points and times of rising and setting—corresponding variation of length of day and night—its connection with the seasons. When it is noon. Variation of clock time with difference of longitude—examples given. What a clock is. A good clock more regular than the sun. Why. Uses of a noon-mark and the table Equation of Time in almanac (useful and easily shown in class-room).

Solar influences—brief reference to animal and vegetable life, and to currents in atmosphere and oceans, etc.

Distance of the sun—magnitude.

What the telescope tells us of the sun—(briefly) read.

Solar System.—Brief general outline of its composition and arrangement. Use a diagram.

The Moon.—Phases. Why. New moon, where first seen. Eastward motion in orbit—the word *month*. The "old moon in the new moon's arms"—why the dark side is then visible (effect of "earth-shine"). Eclipses lunar and solar (briefly). Lunar influences—tides—pseudo-scientific and superstitious notions about the moon's influences. Distance and size of the moon. What the telescope tells about the moon (read).

The Planets.—How known—why so called. *Fixed* stars – why so called. Names of chief planets—make use of almanac to identify them. How they severally look to the naked eye. Morning star, evening star. What the telescope tells us of the chief planets (read).

Fixed Stars.—A few general ideas in regard to their enormous distances—magnitude—how known to be suns. What the telescope tells of their number.

The following should from time to time receive brief attention and explanation, so much at least as to insure the pupil's having some intelligent ideas concerning them. Comets, Meteors, Milky Way, Aurora, Zodiacal Constellations, Zodiacal Light. Importance of Astronomy to Commerce.

COURSE OF INSTRUCTION IN THE GERMAN AND FRENCH LANGUAGES.

COURSE OF INSTRUCTION IN THE GERMAN LANGUAGE.

FOURTH GRADE.

1. *The Alphabet.*—Both printed and script, with exercises in reading and writing.

2. *Grammar.*—Declension of the Definite and Indefinite Articles and the Noun; the present and imperfect tenses of *sein* and *haben.* The cardinal numbers from one to one hundred.

3. *Translations.*—Both oral and written, of simple sentences, including examples under the rules learned in the grammatical lessons of this grade, as well as subject, predicate, object, and simple adjuncts.

4. *Colloquial Exercises.*

THIRD GRADE.

1. Exercises in Reading and Writing, continued.

2. *Grammar.*—Declension of Adjectives and Pronouns. The active voice of the weak conjugation.

3. *Translations.*—Oral and written, including examples under the rules of the grammar lessons of this grade, as well as of prepositions; also easy compound sentences.

4. *Colloquial Exercises.*

SECOND GRADE.

1. Exercises in Reading and Writing, continued.

2. *Grammar.*—The passive voice of the weak conjugation. The principal parts of strong and irregular verbs.

3. *Translations.*—Oral and written, of sentences affording practice in the application of the several tenses of the verb, and in compound sentences.

4. *Reading.*—From a German Reader, with translations into English, and exercise in etymology.

COURSE OF INSTRUCTION IN THE FRENCH LANGUAGE.

FOURTH GRADE.

1. *Reading.*—Rules of Pronunciation and the accents.

2. *Grammar.*—The Definite and Indefinite Articles; Nouns, formation of the plural; Adjectives, formation of the feminine gender and comparisons; Auxiliary verbs *avoir* and *être.* First conjugation of regular verbs.

3. *Translations.*—Oral and written, including exercises on the grammatical rules taught in the grade; also the use of nouns in a partitive sense, the place of nouns in a question, and the form of negative sentences.

4. *Colloquial Exercises* adapted to the grade.

THIRD GRADE.

1. *Reading and Pronunciation*, continued.

2. *Grammar.*—Pronouns; the second, third, and fourth conjugations of the regular verbs; some of the principal irregular verbs; adverbs.

3. *Translations.*—Oral and written, on the grammatical rules taught in this grade.

4. *Colloquial Exercises* adapted to the grade.

SECOND GRADE.

1. *Reading and Pronunciation*, continued.

2. *Grammar.*—Regular verbs reviewed; irregular verbs

continued; the principal rules on the use of moods and tenses.

3. *Translations* from a French Reader; also oral and written translations in the grammatical rules of the grade.

4. *Colloquial Exercises* adapted to the grade.

5. *Easy Compositions.*

INSTRUCTIONS AND SUGGESTIONS.

1. The course of instruction in German and French has been framed with a view to impart to the pupils of the higher grades of the Grammar Schools a rudimentary knowledge of these two languages, as well as to enable the pupils to acquire, by comparison, a better insight into the structure of the English language.

2. *Pronunciation and Reading.*—As the rules of pronunciation in these languages differ very widely from those that prevail in English, it is of importance, from the beginning, to direct the pupils' attention to these differences. They should be required to practise as soon as possible all the peculiar sounds of the foreign language; and this practice should be continued in every recitation until they are able to pronounce these sounds with considerable facility.

3. It is much better to practise the sounds as they occur in words, than to practise separately as phonic exercises. The pupils will more easily acquire the sounds of the German *ü* and *ch* by pronouncing the word Bücher than by a continuous repetition of these as separate sounds.

4. It should always be borne in mind by the teacher that the method of learning a foreign language should approximate as nearly as possible to that by which the

mother tongue is acquired; and that the acquisition of a correct pronunciation will be sooner made by imitating the sound, as pronounced by the teacher, than by memorizing any set rules.

5. *Grammar.*—Care should be taken not to waste time in the needless memorizing of grammatical rules. A familiarity with the principal inflections in the different parts of speech will suffice to enable the scholars to understand the reading lessons, and to practise easy colloquial exercises.

6. *Translation.*—The translation of simple sentences into English should be commenced as soon as possible, as this exercise affords valuable practice in the application of the grammatical knowledge acquired. The translation should at first be entirely literal, to be followed by a comparison of the idiomatic expressions of the two languages, as far as they occur in the lesson. This practice becomes especially important in the Second Grade, in which a Reader is to be employed, and in which the pieces to be translated are longer and more difficult. Written translations should be frequently required, as this promotes care and precision in rendering the meaning, and besides is particularly valuable for the training which it affords in English composition.

7. *Colloquial Exercises.*—These are of the greatest importance in the acquisition of a foreign language. The teacher, almost from the first, by a simple series of object lessons, can familiarize the pupils with many of the common colloquial forms of expression; and this practice can be continued in the use of graded exercises so that in a short time the ear and the tongue of the pupils will become familiarized with the words of the foreign language and a large number of their most necessary combinations.

8. *Etymology.*—As the German language is nearly akin to the Anglo-Saxon, and the French language to the Latin element of English, there is for almost every word, both of the German and the French language, some word in English that may be traced to the same root, though its meaning may be considerably modified. In most cases this affinity is so striking that a simple reference to it will be all that the pupil needs to perceive it. In other cases more care is required to enable the pupil fully to understand the relationship of the words and their meanings, especially when the latter have become changed. All such exercises will be found very valuable and interesting, as the pupil will recognize in German and French roots and affixes old etymological acquaintances, made in the study of English in preceding grades. The study of the relationship of English with the foreign language will aid very greatly in giving to the English-speaking pupil a knowledge of his mother tongue.

GENERAL REGULATIONS

RELATIVE TO GRAMMAR SCHOOLS.

Size of Class.—No class shall contain more than sixty pupils; this is a very important restriction, and should be strictly observed by every Principal. (See "Seating Capacity," on a subsequent page.)

Progress of Classes.—Whenever it is found that a class has advanced further in one or two subjects of its grade than it has in others, the Principal of the school may direct the teacher to devote less time to the subjects in which the class has thus advanced, and to give more time to the subjects in which the class has made the least progress: provided, however, that the law prescribing the *minimum time* per week be strictly complied with. By this means the grade of the class may be equalized in all its studies.

The Course of Study for one grade must be completed and thoroughly reviewed, and the pupils *promoted*, before they can enter upon any part of the Course of Study of the next higher grade.

In each grade, certain subjects, such as Arithmetic, Geography, Drawing, and Oral Lessons, may be profitably divided into four parts, to be assigned to as many successive months; the work of the fifth month to include a careful reconsideration of the essential points. This plan,

if adopted, will be understood not to supersede the "brief monthly reviews" specifically called for by the Course of Study.

1. *Order of Exercises, etc.*—In the several grades the minimum time for Language Lessons, per week, shall be 5 hours; Arithmetic, 3 hours; Penmanship, 2 hours; Geography, 1 hour; Drawing, 40 minutes; History (Grades 1, 2, 3, 4, and 5), 40 minutes.

The remaining time per week to be distributed at the discretion of the Principal.

2. Opening Exercises, 15 minutes; noon intermission, 60 minutes.

Opening Exercises to commence punctually at 9 o'clock A.M., and dismissal at 3 o'clock P.M.

No class exercise shall take place before 9 o'clock A.M., or after 3 o'clock P.M.

3. *Reading.*—In the reading lessons of each grade the pupils shall be required to state in their own language the subject-matter of the lesson. Prose and verse recitations by the pupils in the school shall be selected from books upon the supply list of the Board of Education.

4. *Use of Pencils and Pens.*—The pupils not to be allowed to write with short pencils; in all the grades particular attention to be given to the proper manner of holding the pen, and the position at the desk. The exercises in each grade to be such as are required to give ease and rapidity, as well as accuracy in style. Blackboard instruction to be given in each grade. Pupils of the first five grades to be supplied with blank books for dictation exercises, which should be given at least once a week.

5. *Composition.*—Compositions shall be written once a week in all grammar classes, in presence of the teachers, upon subjects connected with the oral lessons of the grades,

or upon subjects read and explained in the class-room; and these compositions shall be criticised and rewritten. Home work shall be limited to the First Grade.

6. *Dictation and Correction of Language.*—Exercises in writing sentences and paragraphs, from dictation, shall be given in each grade, and the pupils in all the grades shall be trained in the correction of language, and taught to avoid common errors of speech.

7. *Arithmetic.*—Rapid calculation in the simple rules of Arithmetic should be practised by all the pupils from the lowest to the highest grade.

8. *Vocal Music.*—Instruction in singing shall be given to the pupils in every grade, except the first grade of boys. The music used shall be such as is found in the books contained in the supply list of the Board of Education.

9. *Sewing.*—Instruction in sewing may be given to the pupils in the Female Grammar Schools. (By-Laws, § 151, page 255, Manual 1884.)

Lessons and Recitations.—No lesson shall be given to a pupil to be learned out of school until it shall have been sufficiently explained and illustrated by the teacher to the class; nor shall the lessons be such as to require a period of study each day, in the case of a child of ordinary capacity, longer than two hours. Exercises in grammatical analysis and parsing, and written and mental arithmetic, shall not be assigned for home-study, except to pupils of the First Grade. (By-Laws, § 155, page 262, Manual 1884.)

In every class, however well graded, the pupils will differ much in age, health, mental capacity, and home advantages. A correct and judicious classification by the Principal will reduce this inequality to a minimum; but there will still remain a wide field for the exercise of discrimination, care, and caution on the part of the class teacher.

The lessons should, in all respects, be adapted to the average ability of the pupils of the class; but, even beyond this, some allowance will often have to be made in the case of pupils of inferior mental capacity or inferior opportunities for home-study. Teachers must bear in mind that the one great object of home-study is to train the pupils to self-exertion—to give them the ability to depend upon their own efforts as students, and by degrees to dispense with the aid of a teacher. It is, therefore, of supreme importance to avoid everything that will discourage, or deprive of self-reliance; and nothing has a stronger tendency in this direction than the imposition of excessive tasks.

Teachers are especially admonished to be considerate toward pupils of a delicate constitution, an over-excitable brain and nervous system, or in temporary ill-health. Many children of this class are precocious in mental activity and exceedingly ambitious to excel; and the greatest care is required to prevent them from injuring themselves by an inordinate devotion to books and study.

The *length* of the tasks imposed should be most carefully scrutinized and adjusted. The practice of assigning a *fixed number* of words, lines, paragraphs, pages, or examples, without a minute inspection of their nature or contents, is often accompanied with disastrous results. The pupils are wearied and discouraged; and the parents, finding the work of the school-room transferred to the home-circle, lose all confidence in the judgment and ability of the teacher.

The teacher should ascertain the methods which pupils employ in home-study. Verbatim study is to be discouraged. While making the necessary preliminary explanations, a brief abstract of the leading points should be

written upon the blackboard, and made the basis of the recitation. This will do much to induce a rational method in study, and prevent a slavish adherence to the text.

Unless thoroughly familiar with the details of the text-book, the teacher needs special and renewed preparation quite as much as the pupils. Without this he will not succeed. The recitations should be spirited exercises. The questions should be as definite as possible. The teacher should carefully avoid stating in the question any of those facts or principles that should be given by the pupil. The habit of repeating the pupil's answer should be avoided. Pupils should be invariably required to use natural and proper tones in recitation, to enunciate distinctly, and to avoid errors in speech. If this be not done, the special lessons of the reading-book or the grammar will be of little avail to break up the pernicious habits of speech which the teacher has himself, by his neglect, assisted to fix.

The teacher should advise with his pupils as to their hours and opportunities for home-study. Household duties, cramped and noisy homes, and bad light, no doubt greatly interfere in many cases. These should be as far as possible ascertained and allowed for. On account of the tendency to myopia caused by studying by artificial light, very small print should be entirely excluded from home-lessons. The many hours of confinement in the crowded class-room, and the long-continued and close attention required there, make mental rest and relaxation, with some kind of physical exercise, indispensable to growing boys and girls. The teacher should advise that these come before home-study.

Reviews.—In connection with each new lesson, such a review of previous lessons in the same subject should be

had as will cause the pupils properly to associate the facts previously learned and those of the new lesson.

Brief reviews of the lessons on each subject should be had on Friday of each week.

On the last Friday of each month there shall be, in every class, a general review of all the studies of the previous month, at which review all text-books shall be laid aside by teachers and pupils. (By-Laws, § 156, page 262, Manual 1884.)

Physical Training.—The pupils should be exercised daily, in such a manner as to expand the lungs, develop the muscles, and impart an easy and graceful carriage to the body. Calisthenic exercises, to the utmost practicable extent, should be employed for the attainment of these objects. Let the windows be opened, both at the top and at the bottom, for two or three minutes, while the pupils stand and sit several times in succession, and also while they engage in other physical exercises. Due attention should be given to securing a good ventilation of the class-room, but all improper use of the windows and exposure of pupils to drafts while sitting must be carefully avoided. (See "Physical Education.")

Discipline.—The children *should never be compelled to sit without employment for the mind, the hands, or the body.* As a means of preserving good order in the class, attract the attention of the pupils by introducing new subjects, by changing the manner of giving the lesson, or by allowing individual pupils to take a special part in the lesson exercises.

They should be taught cleanliness by being led to observe what it is to be cleanly; and to be truthful and obedient, by perceiving examples of these virtues; and to avoid all bad habits, by being led to look upon them with

dislike. They should be led to do right by encouragement rather than driven to do so by fear. Judicious praise is more efficient than scolding. (See "Government and Discipline" for instructions.)

Manners and Morals.—Such instruction should be given daily to the pupils of all the grades as will foster a spirit of kindness and courtesy toward one another, a feeling of respect toward parent and teacher, and a love of cleanliness, order, law, and truth. (See "Moral Education," page 15; also "Government and Discipline," page 11, for instructions.)

School Sessions.—The several schools shall be opened at nine o'clock A.M., and the sessions shall be continued until three o'clock P.M., with an intermission of one hour at noon, when the pupils may leave school. An intermission, not to exceed twenty minutes, may also be given during the morning sessions.

No school shall be dismissed, except by special authority of the Trustees, sooner than three o'clock P.M., except that in case of very wet or stormy weather the Principal may detain the pupils in school between the hours of twelve and one o'clock; but in such cases the school shall be dismissed for the day at two o'clock P.M.

Meritorious pupils, as a reward, may be permitted to leave school one hour earlier on Friday of each week. In no case shall any school be dismissed before three o'clock P.M., except as provided in Section 64. (By-Laws, § 63, page 147, Manual 1884.)

Vacations and Holidays.—The vacations and holidays allowed in the schools in the several wards shall be as follows:

Every Saturday throughout the year; the day commonly known as Good Friday; the twenty-second day of Febru-

ary; the fourth day of July; any day appointed by the President of the United States or the Governor of the State for a public fast or thanksgiving, and the day thereafter; the twenty-fifth day of December, the second day of January, and the intermediate days; the thirtieth day of May; election day; the day next following any day above specified, when such latter day shall be Sunday, and the interval between the third of July and the second Monday in September. (By-Laws, part of § 63, page 148, Manual 1884.)

Reading the Bible.—All the schools of this city under the jurisdiction of the Board of Education shall be opened with reading a portion of the Holy Scriptures, without note or comment. (By-Laws, § 134, page 208, Manual 1884.)

Doors to be Unfastened.—And all modes of egress, including the visitors' doors, shall be left unfastened during school hours. (By-Laws, § 61, part of subdivision 2, page 140, Manual 1884.)

Pupils Must be Residents of the City.—No person other than an actual resident of the city of New York shall be allowed to attend the Normal College or any school under the control of this Board. A boarding and lodging, by a minor, within the city, who leaves the house of his or her parents in another State or county, merely to gain an opportunity to attend the Public Schools, does not constitute such minor a resident within the meaning of the statute.

Where a parent, residing in another State or in another county, sends his minor child to the city of New York for the temporary purpose of enabling that child to attend and receive the benefits of the Public Schools, in nowise parting with his control over such child, and intending that the child shall return to him as soon as that temporary process is accomplished, such child, although not returning to his parents, except at considerable intervals of

time, is not a resident in the city of New York within the meaning of Section 35 of the Act organizing and regulating the free school system within the city of New York.

Cases will occur to which this rule may not be applicable to the facts; in such case, if the teacher has any difficulty in determining whether the child be a resident, it shall be referred to the Board. (By-Laws, § 127, page 201, Manual 1884.)

Ages of Pupils.—All children between the ages of five and twenty-one years, residing in the city and county, shall be entitled to attend any of the common schools therein. (Statute Laws, § 1051, page 36, Manual 1884.)

Vaccination.—No pupil shall be allowed to attend any school, nor shall any teacher be employed in the same, unless such pupil or teacher has been vaccinated.

Every Principal of a school shall require satisfactory evidence of such vaccination as a requisite for the admission, employment, or continuance of a pupil or teacher, and the Principal shall also enter in the register of the school the dates, as near as possible, of the respective vaccinations of the pupils and teachers, and shall co-operate with such agents of the Board of Health as may be authorized to visit the schools for the purpose of examining and vaccinating the pupils, and shall require a revaccination of all pupils ascertained by said agents of the Board of Health not to be fully protected by a former vaccination, and no pupil refusing to be so revaccinated, either by the agent of the Board of Health, or by the physician of the family to which he or she may belong, shall be permitted to attend any Public School until such requirement is fully complied with.

A certificate of any physician in good standing in his profession, stating that the pupil does not require revac-

cination, shall be accepted by the agents of the Board of Health in lieu of a personal examination. (By-Laws, § 130, page 206, Manual 1884.)

Contagious Diseases.—Whenever it becomes known to the Principal or teacher in charge of a school that a contagious disease prevails in a house other than a tenement in which a child or children attending the school lives or live, such child or children shall be immediately excluded from the school, and shall not be readmitted except as elsewhere in this article provided.

Whenever the Principal or teacher in charge ascertains that a contagious disease other than small pox or typhus fever exists in a tenement-house, but on one floor only, a child or children living on another floor of the same house need not be for this reason excluded, but children thus situated must be questioned daily about their health and that of their respective families; and must be sent home at the first symptom of illness, or the first intelligence of contagion in their families.

But if a contagious disease of any description exists on more than one floor of a tenement-house, or if the disease existing on only one floor be small-pox or typhus fever, all children living in the house must be promptly excluded from school.

Children excluded pursuant to the above rules shall not be again permitted to attend school—

In case of scarlet fever, until three weeks after the *beginning* of the last case, on the floor or in the house, according to whether the exclusion has applied to a floor or an entire house under the above rules.

In case of measles, until two weeks after the *beginning* of the last case, on the floor or in the house, according to the extent of the exclusion.

In case of diphtheria, until one week after the *termination* of the last case, on the floor or in the house, according to the exclusion.

In any case of scarlet fever, measles, or diphtheria, until a certificate of the Board of Health is produced, stating that the apartments, bedding, and clothing affected by the contagion have been properly disinfected.

If the disease be *small-pox* or *typhus fever*, children who have been in such a case excluded must not resume their attendance without producing a certificate from the Board of Health stating that it is safe for them to do so.

New scholars applying for admission, and living in houses or on floors where a contagious disease prevails, must be admitted or excluded in compliance with the above rules.

Principals and teachers in charge are required to communicate to the Clerk of the Board of Education any information received by them relative to this subject and not known to be in his possession. (By-Laws, § 166, page 283, Manual 1884.)

Seating Capacity.—It shall be the duty of every Principal to reject all applications for the admission of pupils into any school or class whenever the room occupied by the same is filled to the extent of its seating capacity. In fixing the seating capacity of rooms, the following shall be a minimum allowance of floor surface and air space per pupil :

In the three lower classes of Primary Schools and Departments, five square feet and seventy cubic feet.

In the three higher grades, six square feet and eighty cubic feet.

In the four lower grades of Grammar Schools, seven square feet and ninety cubic feet.

In the four higher grades, nine square feet and one hundred cubic feet.

In the admission of pupils, those residing nearest to any school shall in all cases have the preference. All rejected applicants shall be sent to the nearest school having accommodations for them.

The seating capacity of each room in each school building (estimated in accordance with the provisions of this by-law) shall be conspicuously posted in each room. (By-Laws, § 33, subdivision 14, page 103, Manual 1884.)

See "Size of Class," page 151.

License Necessary.—No person shall be permitted to perform service in any position as a teacher until licensed. * * * (By-Laws, § 25, part of subdivision 2, page 79, Manual 1884.)

Teachers to Report their Absence.—Any teacher absent from duty shall report promptly, in writing, to the Principal of the school, the cause of such absence, and state its probable duration, and any teacher wilfully making a false report shall thereby forfeit his or her position. * * *

No subordinate teacher, absent from duty, who fails to communicate promptly with the Principal, shall be excused for such absence, nor shall any teachers absent be excused except upon a report thereon by the Principal to the Board of Trustees of the Ward. (By-Laws, § 33, part of subdivision 8, page 100, Manual 1884.)

Female Teachers to Report Marriage.—Any female teacher marrying, shall report in writing her married name and address to the Clerk of this Board and Chairman of the Board of Trustees of the Ward in which she is employed; and any teacher failing to comply with this by-law within thirty days after her marriage, shall thereby forfeit her position as teacher, and all salary that may be

due her from the time of her marriage. (By-Laws, § 33, subdivision 8, page 100, Manual 1884.)

Time Occupied in Teaching.—It shall be the duty of every teacher to occupy the whole of each school session, or time for which the teacher is employed, in the purposes of instruction, or the making of entries necessary to be made at the time; and no assistant teacher shall draw a salary or receive compensation as a special teacher, if employed as such during the regular school hours. (By-Laws, § 33, subdivision 12, page 103, Manual 1884.)

Forfeiture of Position.—The situation of a teacher or janitor shall be forfeited for disgraceful or immoral conduct, incompetency, or wilful violation of any rule or regulation of this Board; and no teacher or janitor so removed shall thereafter be employed in any school, unless the forfeiture be remitted by this Board. (By-Laws, § 135, page 209, Manual 1884.)

See, also, *Violation of the By-Law* relative to corporal punishment.

Corporal Punishment Prohibited.—No corporal punishment of any description shall hereafter be inflicted in any of the common schools. (By-Laws, § 44, page 122, Manual 1884.)

Violation of this By-Law.—It shall be the duty of every Principal, Trustee, Inspector, or Superintendent, when cognizant of the fact, to report to the Board of Education the name of any teacher who may have resorted to unusual punishments tending to inflict physical injury, or to evade the by-law abolishing corporal punishment in the schools under the control of the Board.

Any teacher found guilty of a violation of the by-laws of this Board, in regard to corporal punishment, shall be liable to a penalty of forfeiture from his or her salary of

not less than five nor more than thirty days' pay, or dismissal from school, as in the discretion of the Committee on Teachers may be deemed just and proper; provided the action of the Committee be approved by the Board of Education. (By-Laws, § 44, page 122, Manual 1884.)

Review of Studies to Precede Promotions.—Every examination for promotion to a higher grade shall be preceded by a thorough review of all the studies pursued in the grade from which said promotion is to be made. (By-Laws, § 154, page 262, Manual 1884.)

Credit Marks.—1. In every class of the Primary and Grammar Schools the daily record of credit marks awarded to the pupils for regular and punctual attendance, and for excellence in deportment and in the several studies and exercises, shall be kept in the book known as "School Record No. 7."

2. In all of the Grammar Grades, and in the Primary Grades 1, 2, and 3, the daily maximum of credit marks for conduct shall be 10; for regular and punctual attendance, 10; and for each recitation or other exercise, 10. In awarding the credit marks, the various degrees of merit shall be indicated by 10 for "perfect," 8 to 5 for "imperfect," and 0 for "failure."

3. At the close of each calendar month, the product obtained by multiplying the whole number of recitations and other class exercises during the month by 10, added to the product of the whole number of school-days of the month by 20, shall constitute the standard number for that month. This number shall form the basis of all merit rolls, certificates of merit, and monthly reports to parents.

4. In the Primary Grades 4, 5, and 6, the daily maximum of credit marks for conduct shall be 10; for regular

and punctual attendance, 10 ; and for all of the class exercises taken together, 10 ; the maximum of forfeiture for or during any one exercise being 2. The standard number for the month shall be obtained by multiplying the number of school-days by 30.

5. If extra credit marks are awarded for superior merit, they shall in no case be allowed to exceed ten per cent. of the standard number.

6. In no case shall credit marks earned for attendance, or for recitations or other exercises, be forfeited for misconduct.

7. In the column headed "attendance," each half day's attendance shall be marked separately.

8. When diaries are used, they shall be marked to correspond with the general class record kept as above directed.

9. Whenever it shall be satisfactorily shown by the certificate of the parent or guardian that pupils have been prevented from attending school in consequence of sickness or religious observances, their absence shall be excused without a forfeiture of the usual certificate of merit, and as far as possible without loss of class standing thereby. Such pupils are nevertheless to be considered as absentees. (By-Laws, § 128, page 203, Manual 1884.)

Incorrigible Pupils.—Any pupil found to be incorrigible, or persistently disobedient to and regardless of the rules and regulations prescribed for the government of the school or class, or of resisting the authority of the Principal or class teacher, or who, by a reckless depravity, may injure or demoralize the school or class, may be suspended by the Principal from the school.

It shall be the duty of the Principal of every school thus suspending a pupil, to give immediate notice thereof to the parent or guardian of such pupil, and also to re-

port the same to the City Superintendent and the Chairman of the Board of Trustees of the Ward.

The parent or guardian of such pupil may, within ten days thereafter, appeal from the action of the Principal to the said Trustees, who shall thereupon investigate the matter, and report their action to the City Superintendent.

If no such appeal be taken, or if such appeal be dismissed by the Trustees, it shall be the duty of the City Superintendent to notify the Principal of every other school for the same sex, of the name of such suspended pupil, and he or she shall not be admitted into the same or any other school until satisfactory proof of amendment on the part of such pupil shall have been furnished to the City Superintendent, whose certificate of the removal of the disability shall entitle any suspended pupil to readmission in the same or any other school.

The Trustees may require the transfer of any pupil suspended from one school to any other school under their management, if, in their judgment, they shall deem it beneficial or advantageous to such pupil. (By-Laws, § 44, page 120, Manual 1884.)

Pupils not to be Sent from School.—Pupils shall not be sent from the school premises, upon errands, during the school hours, except in cases of necessity or emergency, and with the consent of the pupil, and in such cases only by the authority of the Principal or Acting Principal, who only shall be authorized to send a pupil of suitable age and discretion, and shall record in a suitable book the name of the pupil so sent, with the date, the occasion, and the duration of absence. (By-Laws, § 65, subdivision 4, page 151, Manual 1884.)

Exhibitions.—No public exhibition requiring special

preparation shall be given in any school or department, if at all, oftener than once during each year, except by permission of the Board of Trustees, and no public exhibition or entertainment shall be given outside the school building without the consent of the Board of Education. (By-Laws, § 156, page 263, Manual 1884.)

Gifts Prohibited.—No teacher shall make or contribute any gift to a school officer or superintendent, nor shall money or other things be in any case collected or taken from a pupil or teacher, for the purpose of presenting a gift or testimonial to a teacher, school officer, or superintendent, or for any other purpose, unless previously sanctioned by this Board. (By-Laws, § 133, page 207, Manual 1884.)

Extra Compensation to Teachers.—No compensation shall be received by any teacher for instruction given in any school building, except the salaries paid by this Board. (By-Laws, § 133, part of subdivision 1, page 208, Manual 1884.)

See also "Time Occupied in Teaching," page 167.

Conditions Requisite to Engagement.—No teacher shall be appointed in any school to whom any school officer entitled to act upon the question of the appointment or payment of such teacher is related, by either blood or marriage, as husband, father, son, brother, uncle, nephew, or first cousin; but the provisions aforesaid shall not apply to the appointment or promotion of teachers employed in the schools previous to the election or appointment of a school officer who may be related to said teacher. (By-Laws, § 33, subdivision 1, page 93, Manual 1884.)

Additional Teachers—How Granted.—No teacher shall be appointed by the Board of Trustees in any Ward unless the average attendance of pupils shall be equal to at

least thirty-five to each teacher in a Grammar School, and at least fifty to each teacher in a Primary School (exclusive of the Principals and teachers of special subjects), based upon the sworn returns, made by the Principal, for the year ending December 31st, next preceding. In mixed schools and departments, for every thirty-five pupils of a Grammar grade, and for every fifty pupils of a Primary grade, one teacher shall be allowed.

But if the Committee on Teachers shall deem it necessary for the proper instruction of the pupils of any school, that additional teachers should be employed therein, it shall be their duty to investigate the same, and if found necessary, to authorize the Trustees of any Ward to employ such additional teachers. When such teachers are authorized to be employed, said committee shall designate the time from which the said employment shall commence and at which it shall terminate, and the amount of salary to be paid, subject to the general regulations prescribed for teachers' salaries; and no additional teacher so authorized shall be paid except for the time and at the rate so stated. (By-Laws, § 33, subdivision 2, page 93, Manual 1884.)

Vice-Principals and Male Assistants.—No Vice-Principal shall hereafter be appointed in any Grammar or Primary School or Department. No more than two male assistants shall be appointed in any Male Grammar School, unless the average attendance of scholars for the year ending on the preceding 31st day of December, shall have exceeded two hundred and fifty pupils of a Grammar grade; nor more than three male assistants, unless the average attendance shall have exceeded five hundred. No more than five male assistants in any Male Grammar School shall be allowed. (By-Laws, § 33, subdivision 3, page 95, Manual 1884.)

When Teachers may be Employed without Classes.—In no Grammar School, the average attendance of which is less than five hundred, and in no Primary School or Department the average attendance of which is less than seven hundred, shall any teacher, except the Principal, be employed for any other purpose than regular class instruction; nor should more than one teacher, in addition to the Principal, be employed, except as a class teacher, in any Primary or Grammar School, except that in Grammar Schools in which the average attendance exceeds eight hundred, and in Primary Schools or Departments having an average attendance exceeding twelve hundred, two teachers, in addition to the Principal, may be employed, besides those engaged in the regular instruction of classes; and whenever, by reason of the closing of a school, any teachers are without employment, though drawing the salaries of their respective positions, it shall be competent for the Committee on Teachers to direct their employment in positions in which their services may be needed in any ward, according to arrangements to be adjusted with the Trustees of said ward. Provided that nothing in this by-law shall be construed to conflict with section 33, subdivision 2, of the By-Laws, so far as said section gives the Committee on Teachers the power to grant additional teachers. (By-Laws, § 33, subdivision 6, page 98, Manual 1884.)

Absences of Teachers—How Excused.—No teacher shall be excused by any Board of Trustees for absence from duty, unless such absence has been caused by the teacher's illness, or by death in the family of which the teacher is a member. No leave or excuse of absence on pay, for a longer period than two school days in any one month, shall be valid, unless confirmed by the Board of

Education. (By-Laws, § 33, part of subdivision 7, page 99, Manual 1884.)

No leave of absence shall be given to any teacher without the appointment by the Trustees of a licensed teacher, as substitute to take the place of the absentee, when necessary to provide that no class shall be left without instruction; and such substitute shall be paid out of the salary forfeited by the absent teacher; except when the absence of a regular teacher has been excused with pay by the Board of Education, on the recommendation of the Committee on Teachers. The absence of a regular teacher may be excused by the Board, with full pay, on the application of a Board of Trustees, certifying that the absence is necessary for the restoration to health of the teacher. No such application shall be entertained or granted unless in the case of a teacher whose record shall show a meritorious service for five years. Such application shall be referred to the Committee on Teachers, who shall examine the case and report thereon to the Board. No such absence shall be granted or excused for a longer period than three months in the aggregate, and no other application in the same case shall be entertained.

The absence of any regular teacher may be excused by the Committee on Teachers, with full pay, on application of the Trustees, when such absence is caused by or on account of contagious disease. (By-laws, § 33, part of subdivision 9, page 101, Manual 1884.)

Salary of Substitute Teacher.—No salary paid to a substitute teacher shall exceed three-fourths of the regular salary of the position in which the substitute teacher is employed. (By-laws, § 33, part of subdivision 9, page 102, Manual 1884.)

Salaries of Assistant Teachers.—The salaries of assist-

ant teachers shall be graded by the Trustees of the respective Wards in applying the average sums allowed for the respective schools and departments, so that in no case the difference between the salaries of any two successive grades shall exceed the sum of one hundred dollars, as to female teachers, and the sum of three hundred dollars as to male teachers. (By-laws, § 35, subdivision 6, page 111, Manual 1884.)

1. The minimum salary paid to any assistant teacher employed in the schools under the control of the Board shall be five hundred dollars.

2. The salaries of teachers shall commence at the times they respectively enter upon their duties, when legally appointed.

3. No retrospective increase of salary shall in any way be allowed. (By-laws, § 36, page 111, Manual 1884.)

Reducing Salaries of Teachers by Trustees—when Prohibited.—No reduction of salary shall be made in the case of any Principal or Vice-Principal or assistant teacher whose appeal from the action of the Board of Trustees shall have been sustained by the Board of Education, except upon the approval of the said last-mentioned Board; and no reduction shall be made in the salary of any teacher whose removal by a Board of Trustees has not been approved by the Inspectors of a school district, or a majority of them, unless the decision of the latter is overruled by the action of this Board. (By-Laws, § 38, page 113, Manual 1884.)

French and German.—Whenever the parents or guardians of at least thirty pupils attending a Grammar Department shall desire the introduction of French or German, the Trustees of the Ward shall introduce the study of such language in said department, but no child

shall be compelled to study German or French contrary to the wishes of its parents or guardians, expressed either personally or in writing; and whenever the average attendance of pupils engaged in the study of French or German, in any class, shall fall below fifteen for the period of three months, such study shall thereafter be discontinued in said class. (§ 158, page 263, Manual 1884.)

Salaries of Special Teachers of Music, French, German, and Drawing.—Teachers of Vocal Music, Drawing, French, and German shall be classified as special teachers. No salary paid to a teacher of Vocal Music in a Grammar or Primary School, or to a teacher of French or German in a Grammar School, shall exceed the rate of one dollar and fifty cents per hour for the time actually employed in instruction. No salary paid to a teacher of Drawing in a Grammar School shall exceed the sum of two dollars per hour for the time actually employed in instruction.

The time occupied in the teaching of said studies respectively shall not exceed the following, viz.:

Music.—One hour and twenty minutes per week in Primary Schools and Departments.

Music.—One hour and forty minutes per week in Grammar Schools.

Drawing.—Three hours and twenty minutes per week in Grammar Schools.

French.—One hour and forty minutes per week for each class where such study is authorized to be taught in Grammar Schools.

German.—One hour and forty minutes per week for each class where such study is authorized to be taught in Grammar Schools.

No person shall be employed to teach in any school any

study not authorized by the Course of Studies specified by the By-Laws of this Board. Teachers of special subjects shall obtain licenses from the City Superintendent for the subjects which they are required to teach, in the same manner as provided by the rules of the Board for teachers of general subjects. Special teachers of the German and French languages shall not be hereafter employed, except in the manner provided by Sections 158, 159, and 160 of these by-laws as amended.

Whenever a vacancy in the position of a special teacher shall occur, the Committee on Teachers shall determine whether the duties of such position, in any school, shall be performed by a special teacher or by a regular teacher in said school.

In schools where no special teacher of Music is employed, the teacher having charge of the Music shall receive fifty dollars salary in addition to the amount allowed as a regular assistant teacher, provided the usual instruction in Music is given ; but no Principal or Vice-Principal of a school shall be appointed to such position. (§ 39, page 114, Manual 1884.)

Duties of Principals.

Shall Keep Register of Daily Attendance of Teachers.— It shall be the duty of every Principal to keep a register of the attendance of teachers, in which shall be entered daily the time of the arrival and departure of each teacher, and any absence from duty, with the reason of such absence. (By-Laws, § 33, subdivision 10, page 102, Manual 1884.)

Shall Report Absences of Teachers.—It shall be the

duty of the Principal to report, without delay, all absences of teachers in his or her school, to the Board of Trustees, with a statement of the cause of each absence as far as known. (By-Laws, § 33, part of subdivision 8, page 100, Manual 1884.)

Shall Report other Facts.—The Principals of the several schools shall report to the City Superintendent, each month, such facts as he may require in relation to the attendance of teachers and pupils. (By-Laws, § 25, subdivision 5, page 80, Manual 1884.)

Suspension of Pupils.—It shall be the duty of the Principal of every school thus suspending a pupil to give immediate notice thereof to the parent or guardian of such pupil, and also to report the same to the City Superintendent and the Chairman of the Board of Trustees of the Ward. (By-Laws, § 44, part of subdivision 1, page 120, Manual 1884.)

School Sessions Omitted.—A special report from the Principal of each school shall accompany each pay-roll, stating whether or not the whole or a part of any session of such school has been omitted previous to the date of such report, and subsequently to the last preceding report, other than such vacations and holidays as are specially allowed by the By-Laws of the Board of Education; and if the whole or a part of any session has been so omitted, for what reason, and by what authority the same was omitted. (By-Laws, § 65, page 149, Manual 1884.)

Principals may Visit other Schools.—The Board of Trustees of any ward may, however, permit any Principal therein, who may apply therefor, to absent himself or herself from his or her department or school, without loss of pay, for a period not exceeding three days in any one year, for the purpose of visiting other schools in the city,

but such absence shall be reported, as required by the succeeding subdivision. (By-Laws, § 33, subdivision 7, page 99, Manual 1884.)

Provide Statement for Examiner. — Whenever any school is visited for examination by the City Superintendent, or his assistants, it shall be the duty of the Principal of said school to provide the examiner with a statement showing the number of pupils on record in the class, the length of time in it, their age, the studies pursued, the progress of the pupils therein, and such other facts as he may deem requisite to enable him to form a correct estimate of the efficiency of the instruction imparted. (By-Laws, § 162, page 265, Manual 1884.)

Promotions from Primary Schools.—Promotions shall be made from the Primary to the Grammar Schools semi-annually, and not oftener, except by the written permission of the City Superintendent; and no pupil shall be promoted from any Primary School *unless examined in all the studies prescribed for the First Grade of the Course of Instruction for Primary Schools*, and found qualified by the Principal of the Department into which the promotion is to be made; and when found qualified, such pupils shall be promoted without delay.

Pupils may be transferred from the Primary to the Grammar Schools before completing the First Primary School Grade, with the consent of the Committee on Course of Study and School Books, and on the recommendation of the City Superintendent, to whom application may be made by the Trustees in any ward, showing that said transfer is necessary in order to relieve the crowded condition of any Primary School, and to fill vacancies in the classes of the Grammar School. Pupils thus transferred to any Grammar School shall, however, be taught in

the Primary Grade until regularly promoted from the same, but may be counted as a part of the regular attendance of the Grammar School. (By-Laws, § 149, page 242, Manual 1884.)

Pupils Leaving School between the Ages of Eight and Fourteen.—The Principal of every school shall transmit to the City Superintendent, hereinafter mentioned, at the close of each week, a list of children between the ages of eight and fourteen years, who, such Principal shall have reason to believe, have left the school for the purpose of engaging in any employment.

It shall be the duty of the Principal of every school to report to the Agent of Truancy, for the district in which such school is situated, the names of all children between the ages of eight and fourteen years, and those only, whose non-attendance at school, such Principal has reason to believe, is the result of a truant disposition. (By-Laws, § 144, subdivisions 3 and 5, pages 221 and 222, Manual 1884.)

Keep Record of Truants between Ages of Eight and Fourteen.—It shall be the duty of the Principal of every school to keep a record, in a register especially provided for that purpose, of all children between the ages of eight and fourteen years, who have been reported to the Agents of Truancy hereinafter mentioned, for a violation of the said Act of May 11, 1874, as amended May 28, 1876, together with an accurate record of the disposition made of each case by said Agent of Truancy, when reported by them to said Principal.

It shall also be the duty of said Principal, when an Agent of Truancy shall bring to a school any child, between the ages of eight and fourteen years, not registered as a pupil of said school, to enter his or her name upon

said special register, and to note upon said register any facts relating to said child that may have been communicated to said Principal by said Agent of Truancy. (By-Laws, § 144, subdivision 1, page 220, Manual 1884.)

Keep Register of Residence of Parents, etc.—It shall be the duty of every Principal, on the reopening of the schools in September of each year, to ascertain and register the residences of the parents or guardians of each and every pupil attending or applying for admission to the school. (By-Laws, § 65, subdivision 2, page 150, Manual 1884.)

Keep Record of Children Refused Admission.—The Principal of each school and department under the jurisdiction of the Board of Education shall be required to keep a record of all children who are refused admission, and the names, ages, and residences of the same shall be inserted in the monthly report made to the City Superintendent. (By-Laws, § 65, subdivision 3, page 150, Manual 1884.)

Drills for Rapid Dismission.—The Principals of the several schools and departments shall, under the direction of the City Superintendent, instruct and train the pupils by means of drills, so that they may, on a sudden emergency, be able to leave the building in the shortest possible time and without confusion or panic. (By-Laws, § 25, subdivision 6, page 80, Manual 1884.)

Shall Examine Classes and Report.—The Principals of the schools shall examine all their classes in the prescribed branches of study at least twice a year, namely, immediately before each regular promotion, and record the results of the same in a book kept for that purpose. A report of all such examinations shall be sent to the City Superintendent, who shall have it recorded in a book kept for that purpose. The adjectives to be used by the Prin-

cipals in such examination shall be the same as those made use of by the Superintendent under these by-laws. (By-Laws, § 161, page 265, Manual 1884.)

Ascertain that Teacher has License.—It shall be the duty of the Principal of each school to ascertain that every subordinate teacher has received a proper license before such teacher shall be assigned to any duty. (By-Laws, § 25, part of subdivision 2, page 79, Manual 1884.)

Employ Medical Service in Case of Accident.—The Clerk of the Board shall furnish the Principals of the Public Schools in the several wards with a correct list of the names and residences of the Police Surgeons and Health Inspectors living nearest to such schools respectively, with instructions that in case of accidents said Principals shall send for and ask the medical officers herein named for such aid as the necessities of the case may require, and in case of the absence of such officers, the Principal of the school where the accident happens is empowered to employ the services of the first available medical practitioner at the expense of this Board. (By-Laws, § 129, page 205, Manual 1884.)

Pupils not to Purchase Supplies.—The Principal of the school shall procure from the depository, and furnish each pupil with the books, slate, and other supplies required to be used by such pupil; and no pupil shall be requested or required to purchase any book or other article of supply.

School Supplies—Inventory.—When supplies of any kind are needed for any school, they shall be plainly entered in the pass-book provided by the Committee, and the list shall be dated and attested by the signature of the Principal, and countersigned by the proper officer or committee of the Board of Trustees authorized for the purpose.

An accurate inventory shall be made, during the last week in each year, of the books, slates, maps, and all other articles usually embraced under the name of supplies, in every school within the jurisdiction of the Board of Education—blank forms of inventory being furnished by the Clerk for the purpose—the same, when completed, to be forwarded to and filed in the Clerk's office.

The inventory shall designate the three conditions of supplies on hand, in separate columns, viz., Good, Half-worn, and Old. In estimating the stock on hand, the whole of the class "Good" shall be entered on the list, one-half of the class "Half-worn," and one-fourth of the class "Old," the total being the quantity on hand of each item. (By-Laws, §§ 122 and 123, pages 194 and 195, Manual 1884.)

Admission of Pupils to School Building, and their Supervision.—It shall be the duty of the Principal of the school to make provision for the admission of pupils into the building at 8.40 A.M., and on stormy mornings at 8.20; and also to provide suitable supervision of the play-grounds, by one or more teachers, while the pupils remain in the yard.

It shall be the duty of the Principal to make the necessary inspection to ascertain that the school-rooms, yards, etc., are kept in a cleanly condition, and to report in writing to the Board of Trustees any neglect on the part of the janitor, and to report in writing repeated subsequent neglect to the City Superintendent.

Principals to Prepare Pay-Rolls.—The Principal of the male school having the largest attendance in any school building, for his own school, for the other schools in the same building, and for such primary and female schools as shall be assigned to his charge for that purpose by the Board of Trustees for the Ward, shall prepare monthly pay-

rolls for the teachers and janitors employed therein. Each pay-roll shall embrace the names of the persons included therein, the number of days for which they are entitled to pay, and the rates; the amounts to be paid to them severally, with blanks for their signatures, in acknowledgment of the receipt thereof, and the total amount of the payments. It shall be delivered to the chairman of the appropriate Board or Committee on or before the first day of the next ensuing month, and shall be certified and audited by the proper officers and filed with the Clerk of this Board within five days thereafter. (By-Laws, § 40, page 116, Manual 1884.)

Declaration of Independence or Washington's Farewell Address to be Read.—On the school days immediately preceding the fourth day of July and the twenty-second day of February, in each and every year, the Principals of all the common schools of this city shall assemble the pupils of their respective schools and read, or cause to be read to them, either the "Declaration of Independence" or "Washington's Farewell Address to the People of the United States," combining therewith such other patriotic exercises as may be advisable. (By-Laws, § 65, subdivision 5, page 151, Manual 1884.)

To Report Violations of the Rules and Regulations of the Board.—Every Principal shall report to the proper Board of Trustees, and to this Board, all violations of the rules and regulations of this Board, by any teacher or janitor of which the Principal may be cognizant; and each pay-roll shall contain an allegation that the Principal has duly reported every case of such violation by a teacher or janitor included therein. (By-Laws, § 135, page 209, Manual 1884.)

Duties of Janitors.

During School Hours.—It shall be the duty of the janitors to remain in the school buildings, or adjacent grounds, during the whole time the schools are in session, and be at all times ready to render personal assistance in case of any emergency.

* * * * * *

Report to Principal.—They shall also report in person to the Principal of each school at each and every daily school session; and they shall also ascertain, on the first day of every month, by the index of the gas-meters in their respective schools, the amount of gas consumed during the preceding month, and report the same in writing to the Clerk of the Board of Education, who shall keep a record of the same.

It shall be the duty of all janitors who reside on the premises to leave some responsible person in charge during their occasional absence.

Janitors who do not reside on the premises must visit the school building for a sufficient time on each day when the schools are not in session; but in no case should their place of residence be further than five hundred yards from the school premises, unless permission be given by the engineer to the contrary, and all such permissions given by him to be reported to the Board for its approval.

Responsible for Security of Buildings.—All janitors will be held responsible for the security of the school buildings, by locking or otherwise securing all doors, gates, windows, and other means of access. They must also report immediately, to the Trustees or Principal, any damage that may

happen to any part of the school property. (By-laws, § 61, subdivisions 2 and 3, page 139, Manual 1884.)

Teachers' Manual.

If adopted by said Board, it (*The Teachers' Manual*) shall become valid as a rule for the government of teachers in the discharge of their duties, except so far as its provisions are inconsistent with the By-Laws of the Board. (By-Laws, § 28, subdivision 5, page 88, Manual 1884.)

COURSE OF INSTRUCTION FOR JUNIOR EVENING SCHOOLS.

EIGHTH GRADE.

Reading from a First or Second Reader.

Suggestions.—1st, it should be borne in mind that the pupils of this grade have a mental development as well as a practical use of words far beyond the young children for whom a Reader of this grade is chiefly designed; 2d, that therefore the principal efforts in this grade should be to develop a facility in pronouncing all the words of the Reader promptly at sight; 3d, great care should be taken to make the exercises as spirited as the subject will permit; and 4th, considerable attention should be given to distinctness of articulation and correctness of pronunciation.

Spelling and Definitions of the words of the reading lessons.

Suggestions.—1st, the spelling in this grade should be chiefly oral, in order to cover as much ground as possible in each lesson; 2d, before closing the lesson a selection of from five to ten of the most difficult words should be tested by having the whole class write them on the slate; 3d, the difficult words of preceding lessons should be rapidly reviewed at least twice a month; 4th, the spelling and meaning of words of like sound with those in the lessons should be carefully taught; 5th, only those words the meaning of which the pupil is likely to mistake or not to know, should be dwelt upon in the definition exercises; 6th, ability to use words properly in a brief sentence or phrase is the best test of the knowledge of their meaning in the lower grades.

Arithmetic, through multiplication.

Suggestions.—1st, the lesson in arithmetic should consist of three parts: first, a few minutes' rapid class drill with the blackboard to secure facility and precision in the tables of addition, subtraction, and multiplication; second, a few minutes in short practical exercises in

mental arithmetic, chiefly for rapid calculation without analysis; third, the remainder of the time should be given to exercises wrought upon the slate; 2d, all the examples given should be short; 3d, if any analysis is required, it should only be in multiplication, and should then be as concise as clearness will permit; 4th, neat work and legible figures should invariably be insisted upon.

Penmanship.—Elementary exercises in small letters and capitals; also in short words.

Suggestions.—1st, each lesson should first be briefly illustrated upon the blackboard; 2d, the lesson should not always be from printed copies; 3d, the letters should be presented in the order of their difficulty, and short words should be introduced as soon as a few letters have been taught.

SEVENTH GRADE.

Reading from a Third Reader.

Suggestions as in Eighth Grade as far as apposite. Care should be taken to select interesting and instructive pieces.

Spelling and Definitions of the words of the reading lessons; also of miscellaneous words by dictation.

Suggestions as in Eighth Grade, excepting that the exercises in written spelling should occupy at least half the time given to the subject.

Arithmetic.—Short and Long Division, and Federal Money.

Suggestions as in Eighth Grade, except that the words *and Division* are to be added after the word *Multiplication*.

Penmanship.—Words and short sentences.

Suggestions—see 1 and 2 of Eighth Grade.

SIXTH GRADE.

Reading of the grade of a Third Reader continued.

Suggestions as in Eighth and Seventh Grades.

Spelling and Definitions of the words of the reading lessons; also of miscellaneous words from dictation.

Suggestions as in Eighth and Seventh Grades.

Arithmetic through Common Fractions and their applications to Federal Money.

Suggestions.—1st, those of Eighth and Seventh Grades, as far as apposite; 2d, the examples selected should be short and practical as possible; 3d, Common Divisor and Least Common Multiple should be chiefly from inspection and only in immediate connection with their applications to the reduction and combination of fractions, 4th, Addition, Subtraction, and Division may be advantageously taught together on their common basis of Least Common Denominator; 5th, the chief analyses to be taught are those of Common Denominator, Multiplication, and the two cases in Division; 6th, the applications of Fractions to Federal Money should constitute a prominent element of the exercises.

Penmanship.—Words and short sentences, continued.

Suggestions as in Seventh Grade.

FIFTH GRADE.

Reading—a book of the grade of a Fourth Reader, with continuous text, on Familiar Science.

Suggestions.—1st, every lesson should be accompanied with a brief review of the subject-matter; 2d, an occasional general review of the subject-matter will give one of the brief advantages of a continuous text; 3d, difficult words and those requiring explanation should be carefully attended to; 4th, distinctness of articulation and naturalness of tone should have a proper share of attention.

Spelling and Definitions from the Reader, and miscellaneous words.

Suggestions as in Eighth and Seventh Grades.

Arithmetic.—Decimal Fractions and Common Fractions reviewed, with simple business applications of both.

Suggestions.—1st, after teaching the principles of decimal notations, the reduction, addition, subtraction, multiplication, and division of decimal fractions should be taught and explained on the same principles as similar operations in common fractions; 2d, facility in converting simple common fractions to decimals and decimals to common fractions is very important in the business applications of fractions.

Penmanship.—Copies and longer sentences.

Suggestions.—1st, double-lined books, that is, those having both base-line and head-line for the small letters, should not be used; 2d, all members of the class should write the same lesson; 3d, the special difficulties of each lesson should be carefully taught by means of the blackboard.

FOURTH GRADE.

Reading.—From the same Reader as in Fifth Grade.

Suggestions as in Fifth Grade.

Spelling and Definitions as in Fifth Grade.

Suggestions as in Fifth Grade.

Arithmetic.—Compound Numbers, including Federal Money, Tables of Weights and Measures.

Suggestions.—1st, great care should be taken to select those tables which are of most practical importance in daily life; 2d, no long examples should be given; 3d, the analysis, when required, should be brief and simple; 4th, the different values of the pound, ounce, ton, and gallon should be carefully taught; 5th, areas of rectangles and circles, and short examples in finding the contents of boxes, bins, and cylinders, in feet, inches, gallons, or bushels, should constitute a part of the basis of instruction.

Penmanship.—Copies; writing short paragraphs from dictation, or from the Reader or some other book.

Suggestions.—1st, the latter element is by far the more important; 2d, draw attention to the correct use of capitals and points, and to the use of the hyphen at the end of the line; 3d, insist upon the proper

legible medium between a compact and a sprawling hand; 4th, do not allow either vertical or backhand to be used; 5th, insist upon a plain style without flourishes; 6th, permit only such rapidity as is thoroughly consistent with neatness and legibility.

Geography.—An outline of the world; to be taught orally and with the use of the globe and outline map.

Suggestions.—1st, the lessons should be short and spirited; 2d, they should not be allowed to degenerate into mere lectures. The pupils should take a leading and active part in pointing out and describing; 3d, the lessons should include the shape of the earth, its size, zones, seasons, day and night, divisions into land and water, and the principal subdivisions of each. Ideas of latitude and longitude, their necessity and importance. The distinctions of mountain systems, plains, and the location of the most important of each; the most important rivers and lakes; a few of the leading countries, and of the chief commercial and manufacturing cities; 4th, before commencing the lesson the teacher should have as definite ideas as to its plans, limits, and details as in the lessons in arithmetic or penmanship; 5th, frequent and rapid reviews of five minutes each are indispensable.

THIRD GRADE.

Reading.—History of the United States.

Suggestions as in Fifth Grade.

Spelling and Definitions from the reading lessons.

Suggestions as in Eighth and Seventh Grades, excepting that the spelling should be tested only by writing selected words and sentences on slates.

Arithmetic.—Percentage *without Time;* a review of those parts of the compound numbers which are of the most practical importance.

Suggestions as in Fifth and Fourth Grades.

Penmanship.—Copies and paragraphs as in Fourth Grade.

Suggestions as in Fourth Grade.

Geography.—A brief outline of the Western Hemisphere, with the use of the globe and outline maps.

Suggestions as in Fourth Grade, except as to suggestion 3d. The lesson should include, first, very simple outlines of the physical geography of each continent, its form, dimensions, chief mountain systems, plateaus, and plains; its drainage, general climates, and leading vegetable and animal products. The separate countries of the continent should then be considered, great care being taken not to present too many topographical details. The leading cities, resources, commerce, and commercial routes should receive careful attention.

SECOND GRADE.

Reading.—History of the United States continued.

Suggestions as in Fifth Grade.

Spelling and Definitions from the reading lessons.

Suggestions as in Third Grade.

Arithmetic.—Review of simple percentage; interest, and the business rules dependent upon both.

Suggestions.—1st, no subordinate topic should be treated exhaustively before proceeding to the next; 2d, frequent reviews with brief examples will insure correctness, rapidity, and thoroughness; 3d, clear explanations should be required; 4th, before completing the subject of interest, a few exercises should be given in finding interest by tables, and the tables should be explained.

Penmanship.—Copies and paragraphs as in Third Grade.

Suggestions as in Fourth Grade.

Geography.—The Eastern Hemisphere, with the use of the globe and outline maps.

Suggestions as in Third Grade.

FIRST GRADE.

Reading.—General History.

Suggestions as in Third and Second Grades.

Spelling and Definitions from the reading lessons.

Suggestions as in Third Grade

Arithmetic.—General review and completion of business arithmetic.

Suggestions as in Second Grade.

Penmanship.—Paragraphs and business forms and business letters.

Suggestions.—The points of each business letter should be briefly written upon the blackboard, and each pupil then be required to construct the letter himself.

Book-keeping.

Suggestions.—The time given to this subject should not be allowed to interfere with the other subjects required to be taught in this grade.

Geography.—General review, with outline maps.

Suggestions.—Special attention should be given to such important current events as have geographical relations. The daily paper will furnish an abundance of valuable and useful illustrations.

COURSE OF INSTRUCTION IN THE ENGLISH LANGUAGE FOR CLASSES OF FOREIGNERS IN EVENING SCHOOLS.

THIRD GRADE.

1. *Reading.*—Second or Third English Reader; special attention to be called to idiomatic phrases occurring in the lessons.

2. *Penmanship.*—Writing from dictation. The use of capitals to be taught.

3. *English Grammar.*—Special attention to be given to the peculiar sounds of the language; the comparison of adjectives; the formation of the plural; the simple tenses of auxiliary verbs; the principal parts of a few of the most common irregular verbs.

4. *Translations.*—Translations from English into the native language of the pupils, and *vice versa.*

5. *Colloquial Exercises.*—Among the first topics to be selected for colloquial exercises should be the following: (*a*) easy exercises in addition, subtraction, multiplication, and division; (*b*) the human body; (*c*) house and home, garden and field; (*d*) family relations and friends; (*e*) the city we live in; other subjects at the discretion of the teacher, who should keep a list of the exercises.

The teacher should give the usual directions as soon as possible in the English language.

SECOND GRADE.

1. *Reading.*—Fourth English Reader.

2. *Penmanship.*—Writing from dictation, including words and sentences.

3. *English Grammar.*—Special attention to be given to the principal parts of irregular verbs occurring in the Reader, to the passive voice, and to the principal adverbs and conjunctions.

4. *Translations.*—Continued.

5. *Colloquial Exercises.*—The following subjects should be treated of: (*a*) the weather; (*b*) mechanical arts; (*c*) the grocery; (*d*) social amusements; (*e*) the United States and its government; other subjects at the discretion of the teacher, who should keep a list of them.

The medium of instruction should be, as much as practicable, the English language.

FIRST GRADE.

1. *Reading.*—Fifth English Reader, History of the United States, or Constitution of the United States.

2. *Penmanship.*—Writing from dictation.

3. *English Grammar.*—The chief peculiarities of syntax, attention to be called to points of difference between the English and the native language of the pupils. Lessons in composition, with instruction in letter-writing.

4. *Translations.*—Continued.

5. *Colloquial Exercises.*—Review of the exercises of the two preceding grades; other subjects to be selected by the teacher; discussions on the contents of the reading lessons; debates.

Teachers should keep a list of the subjects selected by them for colloquial exercises and debates.

The English language should be exclusively the medium of instruction in this grade.

EVENING SCHOOLS FOR SENIORS.

1. *Reading.*—Including Spelling, Definitions, and Historical Readings.

2. *Arithmetic.*

3. *Penmanship.*

4. *Book-keeping.*

5. *Composition.*

Any pupil upon his admission may, at his option, select not more than two of the said branches of study which he desires to pursue during the term.

It shall be the duty of the Principal of each School for Seniors, by and with the advice and consent of the City Superintendent, to arrange an order of exercises for each evening during the term.

APPENDIX.

FIRST PRIMARY GRADE.

Outline Course.

Language Lessons.—*Reading*—of the grade of an easy Third Reader: the *meaning* of words and phrases read: elementary *sounds* in the pronunciation of words: punctuation marks: *spelling*, as in the previous grade: lessons on *objects*, as in the previous grades, with more complete descriptions of objects; special attention to be given to those properties which fit the objects for their particular uses: *geography*, without text-books—points of the compass; location and direction of familiar places; elementary definitions; shape of the earth, and situation of the principal countries and bodies of water.

Arithmetic.—*Written and Mental.*—*Addition* and *subtraction* continued; *multiplication*—multiplicand not exceeding *six figures*, multiplier not exceeding *four figures; division*—divisors not exceeding 25; practical examples in the several rules: *tables* of Long Measure and Avoirdupois Weight, with review of previous grade; simple practical questions.

Slate-Writing and Penmanship.—On *slates*—brief descriptions of familiar objects: on *paper*—words with capitals; during the last half of this grade one lesson each week to be written from dictation.

Drawing.—On slate and paper, illustrated on blackboard, from dictation and from chart: quadrants with radius of two inches; design composed of straight and simple curved lines symmetrically arranged in the square, equilateral triangle, hexagon, and octagon; two ovate conventional leaves on axis of three inches.

Sewing.—(In girls' classes.)

Vocal Music.—Instruction continued as in Second Grade; teach the singing of simple tunes in the natural scale by numerals, syllables, letters, *la*, *la*, *la*, and by appropriate words

Physical Training.—As in previous grades.

Manners and Morals.—Due attention to be given in each grade to training pupils in right habits.

INSTRUCTIONS AND SUGGESTIONS.

LANGUAGE.

Reading.—The instructions for teaching reading in the two preceding grades, are appropriate as suggestions for this grade. While chief attention should be given to such reading as will enable the pupils to gain the thoughts readily from the printed page, due attention should also be given to such elocutionary exercises as will increase the pupils' ability to speak those thoughts in such a manner that those who listen may understand them.

For the purpose of training pupils to gain knowledge by *silent reading*, require them to read a paragraph *silently*, and then to state the substance of what it contains.

As an exercise in language, allow the pupils to choose a familiar reading lesson, and to write from memory the substance of the lesson, chiefly in their own language. Require different pupils to read what they have written, and other members of the class to notice how their own statements differ from those read. Then the pupils may be allowed to correct their own statements, and to write the lesson again. An exercise of this kind may be given once a week, in place of the *reading* and *slate-writing* exercises. It would be profitable, also, for the teacher to vary this language exercise by reading a short, interesting story and requiring the pupils to write about it.

Meaning of Words.—Read carefully the suggestions given in the Third and Second Grades.

Elementary Sounds and Punctuation.—The suggestions already given for the preceding grades will indicate what ought to be done in these matters.

Such additional attention should be given to diacritical marks as will enable the pupils to ascertain by their aid how the given words in the Readers should be pronounced, and will prepare them for using dictionaries for this purpose.

Spelling.—More attention should be given to written than to oral spelling. Words may be dictated for the pupils to write on their slates; short sentences may be given for the same purpose; the pupils may be required to write in groups the names of kinds of food, of articles of clothing, of furniture, of tools, of occupations, of animals, of trees, of fruits, of things that may be purchased at a grocery, etc., etc. These exercises will enable pupils to learn the spelling of a large class of words in common use.

Object Lessons.—Through the instruction of the preceding grades the pupils will have become familiar with the forms, colors, qualities, materials, and uses of common objects, have learned the terms necessary to an intelligent description of them, and have been provided with suitable facts, to prepare them for practical lessons in language. It is intended that the pupils shall be taught in this grade how to use these facts in gaining a more complete knowledge of the materials, qualities, and uses of articles of food and clothing; also, how to gain appropriate information in relation to occupations, trades, productions, and articles of manufacture. To this end it is desirable that the classification of substances as *animal*, *vegetable*, and *mineral*

should now be taught. Lead the pupil to observe that *animals have animal life, take food, grow, breathe, move from place to place by their own power, have feeling, and die;* that *vegetables have vegetable life, take food, grow, and die;* that *minerals have no life, take no food, do not grow, breathe, move, nor die.*

Animals and vegetables have organized parts—that is, parts adapted to separate and particular purposes; as, eyes, ears, hands, hair, nails, bones, muscles, blood; roots, trunks, limbs, wood, sap, bark, leaves, buds, blossoms, fruit, etc. Minerals have no such organized parts.

The pupils may also be taught that substances such as wool, hair, bone, and skin, which once formed parts of animals, etc., are called *animal substances;* that wood, bark, gum, and sugar, which once formed parts of vegetables, are called *vegetable substances.*

Objects are to be used, as previously, whenever they may be necessary to proper instruction: select chiefly those objects with which the pupils have some acquaintance by personal observation. In giving a lesson the following steps should be taken:

First. Find what the pupils already know about the object; notice and correct their wrong impressions.

Second. Teach them to examine the object systematically in learning its properties, uses, etc.

Third. Train the pupils to describe the object intelligently (stating its chief property, and its most important qualities and uses), and to give other interesting facts concerning it.

Topics for the Lessons.—The following list will indicate topics appropriate for lessons in this grade:

Apple, banana, fig, lemon, orange, peach, raisin; coffee, corn, ginger, nuts, pepper, potato, peanut, rice, salt, sugar, corn-starch, tapioca,

wheat; brick, cotton, calico, flax, glass, earthen-ware, India-rubber, leather, paper, silk, soap, wool; roots, buds, leaves, blossoms, fruit; camphor, chalk, coal, cork, copper, iron, lead, whalebone; baker, blacksmith, carpenter, dressmaker, farmer, grocer, hatter, mason, milliner, painter, printer, shoemaker, tailor; cat, cow, dog, duck, fish, goat, goose, hen, horse, sheep, etc.

It is *not* supposed that lessons will be given on all the above topics, nor that the teacher will confine the lessons to those in this list; but it is desired that the number of lessons shall be sufficient to teach the pupils such modes of observation as will prepare them for obtaining useful knowledge from surrounding objects. If right methods of conducting the lessons be employed, eight or ten subjects, embracing a suitable variety, will be sufficient to accomplish the purpose.

The general plan of proceeding with the lessons may be understood from the following points in the examination of the object:

What is it, *animal*, *vegetable*, or *mineral?*

Is it a *natural production* or *a manufacture?*

Where and *how* is it *obtained?*

What are the *chief occupations* or *trades* required *to obtain* or *to produce it?*

Which are *its most useful qualities?*

What are *its chief uses?*

What is its general shape?—its color?

Give a brief description of the object.

What is produced by the occupation of ——?

What does the ———— do?

In view of the great practical importance of the subject, the condition of the pupils, especially the boys, in relation to color-blindness and other defects of visual perception, should be carefully ascertained. For this pur-

pose, test the pupils' ability to distinguish and match *reds*, *greens*, and *purples*. Harmony of colors should receive attention, especially from the girls.

Geography.—The instruction of the Primary Course in geography is to be given without text-books. It is important that the first lesson commence with things known by the pupils through their personal experience. Attention may be directed—

First.—To the location, direction, and comparative distance from the school, of the streets in the immediate vicinity, and of a few important ones farther away; also, of familiar parks, depots, ferries, and of a few prominent public buildings and places, such as City Hall, churches, libraries, post-office stations, etc.

Second.—To the relative location and direction of places in the vicinity of the city. As far as possible the location of these places should be shown by an outline map of New York and vicinity, or by sketches on the blackboard.

During these lessons the terms *river*, *bay*, *island*, *ocean*, *strait*, etc., will be employed, and the meaning of these terms should be taught, with the aid of chart, map, blackboard, or other available objects.

The names and location of islands, rivers, oceans, etc., need not be taught at this stage of the lessons.

Third.—Extend the lessons about places, villages, etc., by means of the personal experience of members of the class, as obtained by their visits, excursions, and vacation travels. Let the places so mentioned be pointed out on maps. These lessons will prepare the pupils for understanding more clearly subsequent lessons about distant places.

Fourth.—In giving the pupils ideas of the *shape of the earth*, use marbles, balls, oranges, and the terrestrial globe.

Teach the location of different countries, islands, etc., *on the globe first.*

Fifth.—To assist the pupils in remembering the names and locations of the grand divisions, associate with the places, as they are pointed out on the globe and on the map, familiar people, animals, and productions, somewhat as follows: North America, the country in which we live; South America, the home of the monkey, and the place where Brazil nuts, cocoanuts, and India-rubber are obtained; Africa, the home of the Negro, the camel, ostrich, lion, and zebra; Asia, the home of the Chinese, of the elephant, the tiger, and the place where tea, pepper, cloves, and cinnamon grow; Australia, the land of the kangaroo; Europe, the home of the English, Irish, German, French, Italians, etc.

In a similar manner the names and locations of countries and other places may be learned; as, Greenland, the home of the white bear, and the waters around it, the home of the whale from the mouth of which whalebone is obtained; West Indies, the place whence we obtain oranges, bananas, etc.; Spain, the country where cork and raisins are produced.

The most important groups of islands, two or three of the largest rivers and prominent ranges of mountains, and a few of the largest cities of the world may be included in these lessons; also the cold and warm countries may be pointed out: *the boundaries and capitals of countries should not be taught.*

Care should be taken that the pupils do not obtain the false impression that, to travel from a place represented at or near the bottom of a map toward a place represented at or near the top of the map, one must *go up.* In leading the pupils to avoid this common error, point out the

course of the St. Lawrence River, and cause them to understand that its waters flow *down* toward the northeast, and *not upward.*

The relative direction and location of places may be easily illustrated by simple dots on the blackboard, and on slates.

ARITHMETIC.

Addition and Subtraction.—Continued and special attention should be given to teaching the *uses* of these rules by means of practical examples. It is expected that the pupils will have been taught so thoroughly before they are placed in this grade that each one will be able to add and subtract with facility, and with a good degree of accuracy; yet reviews of these rules should be had, with examples as above stated, at least twice each week.

Multiplication.—The simple processes of multiplication having been taught in the previous grade, the exercises given for this grade should be presented in steps, somewhat as follows:

First Step.—Use multipliers similar to the following: 120, 348, 5,630; multiplicands not to contain more than four figures.

Second Step.—Use multipliers similar to the following: 406, 9,030, 8,007; multiplicands not to contain more than five figures.

Pupils should be carefully trained to write *the first figure of each partial product under the figure used as a multiplier.*

☞ *Review each step with practical examples embracing transactions that come within the observation of the pupils.*

Division.—The idea of separating groups of objects and numbers into several equal parts having been illustrated with objects, etc., as an introductory step to division, the teacher should now proceed to show *the different ways by which division may be represented with figures.*

First Step.—Place upon the blackboard the following forms of division:

$$2)8 \qquad 2\overline{)8} \qquad 8 \div 2 = \qquad \frac{8}{2} =$$

Tell the pupils that each of these forms of writing numbers means that they are to find how many *twos* there are in eight; or, that the number 8 is to be divided into *two equal parts.* Let the pupils tell how many each part will contain; then write the number in connection with each example, as follows:

$$2)\underline{8}\,4 \qquad 2\overline{)8}\,\overline{4} \qquad 8 \div 2 = 4. \qquad \frac{8}{2} = 4$$

After repeating the four modes of representing division, with other numbers, require the pupils to copy each form on the slate, and to perform the division.

N. B.—Do not allow the pupils to say "divide two *into* eight." Eight is divided *by* two.

Second Step.—Proceed to *illustrate* the process of division by the *long division form*, using small numbers for the divisor. Use examples first in which each figure of the dividend will contain the divisor without a remainder, thus:

2)48(24	3)96(32	4)84(21
4	9	8
—	—	—
08	06	04
8	6	4
—	—	—
0	0	0

Third Step.—Give examples, with the divisor of one figure, in which remainders occur during the partial divisions, thus:

4)976(244	8)952(119	7)861(123
8	8	7
—	—	—
17	15	16
16	8	14
—	—	—
16	72	21
16	72	21
—	—	—
0	0	0

Fourth Step.—Teach "*short division*," first by working *the same example by both the long and the short form*, thus leading the children to see that one form is much shorter than the other, therefore may be called *short division*, and that the other, as appropriately, may be called *long division.*

The illustrations for any one of these *steps* need not occupy the time given to division for more than *one week;* and the time devoted to the *four steps* should not exceed that assigned to this portion of arithmetic for *one month.* When the divisor is less than 13, *do not allow the long division form to be used after the pupils understand the difference between the two processes.*

Fifth Step--Give examples with divisors from 13 to 25, to be worked by long division, the dividends varying from *four* to *six* figures, including the use of *naughts.*

Examples should be given with a *naught* in the divisor, and also (at the right hand) in the dividend; as, 30)4560: the pupils should be required to work such examples by short division.

Aim first to make the pupils *understand the process* of the rule; then *train them to be accurate;* and finally, *drill in rapidity.* Never attempt to gain rapidity to the neglect of accuracy.

As soon as the pupils understand the manner of doing the work in any rule, give practical examples: do not wait for either accuracy or rapidity before giving such questions.

☞ *The ability of pupils to work practical examples in the four simple rules, is the real test of their knowledge of this subject.*

Mental Arithmetic.—The forms for answering questions in addition, subtraction, and multiplication, in this grade, may be the same as in the Second Grade. Questions may also be introduced which may require both addition and subtraction for their solution, as:

Henry had 18 cents; he gave 2 cents for pencils, and 6 cents for a sponge; how many cents had he left? *Ans.* 10. Henry spent the sum of 2 cents and 6 cents, which was 8 cents. He then had left the difference between 8 cents and 18 cents, which is 10 cents.

The same example might be performed by the subtraction of 2 cents, and then of 6 cents.

Division.—The two following examples will illustrate forms of solution appropriate for mental questions in division:

How many tops at 3 cents each can be bought for 12 cents? *Ans.* 4. As many tops as 3 cents, the price of 1 top, is contained times in 12 cents, which is 4 times.

If 2 apples cost 4 cents, what will 1 apple cost? *Ans.* 2 cents. If 2 apples cost 4 cents, 1 apple will cost one-half of 4 cents, which is 2 cents.

Oral Drills for rapid combinations of numbers may embrace combinations with multiplication, addition, division, and subtraction. See also suggestions for oral drills in the previous grades.

Multiplication Table, reviewed as a *Division Table.*—In making this review the teacher may ask, How many *fours* in 20? How many *fives* in 30? How many *twelves* in 48? etc. The form of the questions may be changed to, In 40, how many *eights?* How many *nines* in 72? The teacher can easily change the form of this review so as to make it both practical and interesting.

Tables of Weights and Measures.—Review the tables of the Second Grade, and teach the following:

Common, or Avoirdupois Weight.	Miscellaneous Tables.
16 ounces make 1 pound.	12 things make 1 dozen.
8 " " 1 half pound.	144 " " 1 gross.
4 " " 1 quarter of a pound.	12 dozen " 1 "
100 pounds " 1 hundred weight.	12 gross " 1 great gross.
20 hundred weight make 1 ton.	20 things " 1 score.
2,000 pounds make 1 ton.	24 sheets " 1 quire of paper.
	20 quires " 1 ream.

Reviews.—After these tables have been thoroughly learned in order, the teacher should conduct brief reviews of the tables of both the First and Second Grades, by questions somewhat like the following:

How many inches in three-quarters of a yard? How many yards in one rod? How many rods in a mile? How many pounds in a half ton? How many pecks in twelve bushels? How many quarts in nine gallons? How many days in a year? How many months in half a year? Which is the longer, six feet or two yards? How many buttons

in a gross? How many sheets of paper in a quire? How many in half a quire?

Simple questions in mental arithmetic may be given, with a view to a practical application of the foregoing tables.

WRITING.

Slate-Writing.—Continue instruction in the use of capitals, the period, the interrogation mark, and the hyphen; the pupils should be taught that a syllable can never be divided. Exercises should be had in writing brief descriptions of familiar objects, and the substance of some previous lesson. The pupils of this grade should be trained in writing exercises from dictation.

Penmanship.—In addition to the exercises in the writing-book, occasional lessons should be given in copying sentences from the blackboard. During the last half of this grade, exercises should be given in writing from dictation.

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